LIBRARY
UNIVERSITY OF CALIFORNIA
DAVIS

State of California
THE RESOURCES AGENCY
Department of Water Resources

BULLETIN No. 94-7

LAND AND WATER USE IN
MAD RIVER—REDWOOD CREEK
HYDROGRAPHIC UNIT

UNIVERSITY OF CALIFORNIA
DAVIS
MAY 7 1965
LIBRARY

APRIL 1965

HUGO FISHER	EDMUND G. BROWN	WILLIAM E. WARNE
Administrator	*Governor*	*Director*
The Resources Agency	State of California	Department of Water Resources

State of California
THE RESOURCES AGENCY
Department of Water Resources

BULLETIN No. 94-7

LAND AND WATER USE IN MAD RIVER—REDWOOD CREEK HYDROGRAPHIC UNIT

APRIL 1965

HUGO FISHER	EDMUND G. BROWN	WILLIAM E. WARNE
Administrator	*Governor*	*Director*
The Resources Agency	State of California	Department of Water Resources

LIBRARY
UNIVERSITY OF CALIFORNIA
DAVIS

Estimates of future water requirements, based on the land and water use studies and projections of foreseeable future development, are now underway in some areas. Results of these water resources and water requirements studies will be published as Bulletin No. 142 series, each covering some or all of the hydrographic units within a drainage area.

These water resources and future water requirements bulletins will provide the basis for outlining the additional projects needed to meet the State's growing water needs. By interrelating the projected water requirements of all areas of the State with the available local supplies, by decades, a recommended sequence and timing for the State's future water development plans will be established. Besides thus forming the chief basis for the Department of Water Resources' all-important project staging program, the data on water resources and water requirements will be a most valuable guide for water development planning by federal local, as well as state agencies.

TABLE OF CONTENTS

Page

FOREWORD iii

LETTER OF TRANSMITTAL xi

ORGANIZATION, DEPARTMENT OF WATER RESOURCES xii

CALIFORNIA WATER COMMISSION xiii

ACKNOWLEDGMENT xiv

PUBLIC HEARING ON PRELIMINARY EDITION OF BULLETIN NO. 94-7 xv

CHAPTER I. INTRODUCTION 1

Organization of Report 3

General Description of Area 4

Historical and Present Development 5

Natural Features 13

Climate 15

Water Resources 18

Local Public Agencies Concerned with Water Development 19

CHAPTER II. WATER USE 21

Water Rights 24

Surface Water Diversions 25

Location System for Surface Water Diversions 26

Descriptions of Surface Water Diversions 28

Records of Surface Water Diversions 37

Index to Surface Water Diversions 41

Imports and Exports 41

Consumptive Use 41

CHAPTER III. LAND USE 47

Historical Land Use 47

TABLE OF CONTENTS (Continued)

Page

Present Land Use 49

Methods and Procedures 51

Irrigated Lands 52

Naturally High Water Table Lands 60

Dry-farmed Lands 60

Urban Lands 61

Recreational Lands 61

Native Vegetation 63

CHAPTER IV. LAND CLASSIFICATION 65

Methods and Procedures 66

Major Categories of Land Classes 68

Irrigable Lands 70

Urban Lands 70

Recreational Lands 72

Other Lands 74

CHAPTER V. SUMMARY 75

Water Use 76

Present Land Use 77

Land Classification 78

TABLE OF CONTENTS (Continued)

TABLES

Table No.		Page
1	Areas of Subunits in Mad River-Redwood Creek Hydrographic Unit	6
2	Recorded Extreme and Estimated Mean Annual Precipitation at Selected Stations in or near Mad River-Redwood Creek Hydrographic Unit	17
3	Temperature Data at Selected Stations in or near Mad River-Redwood Creek Hydrographic Unit	18
4	Summary of Runoff Data, Mad River-Redwood Creek Hydrographic Unit	19
5	Summary of Use and Measurement of Surface Water Diversions in Mad River-Redwood Creek Hydrographic Unit in 1958	22
6	Descriptions of Surface Water Diversions in Mad River-Redwood Creek Hydrographic Unit	30
7	Monthly Records of Surface Water Diversions in Mad River-Redwood Creek Hydrographic Unit	38
8	Index to Surface Water Diversions in Mad River-Redwood Creek Hydrographic Unit	43
9	Land Use in Mad River-Redwood Creek Hydrographic Unit	50
10	Irrigated Lands in Mad River-Redwood Creek Hydrographic Unit	55
11	Land Classification Standards	66
12	Classification of Lands in Mad River-Redwood Creek Hydrographic Unit	71

TABLE OF CONTENTS (Continued)

ILLUSTRATIONS

Illustration No.		Page
1	Coastal Scenery Draws Vacationers	7
2	Natural Resources Provide Industries	12
3	Municipal Diversion Systems	23
4	Agricultural Water Use	27
5	Example of land use delineated on aerial photograph	53
6	Agricultural Land Use	59
7	Industrial Land Use	62
8	Example of land classification delineated on aerial photograph	69
9	Recreational Lands	73

FIGURES

Figure No.		
1	Land Use in 1958	79
2	Classification of Lands	79

APPENDIXES

Appendix		
A	Statewide Water Resources and Water Requirements Studies	A-1
B	Reports on Related Investigations and Other References	B-1
C	Legal Considerations	C-1

TABLE OF CONTENTS (Continued)

PLATES

Plate No.

1 Area of Investigation

2 Land and Water Use

3 Classification of Lands

CALIFORNIA—RESOURCES AGENCY WILLIAM E. WARNE, Director

TMENT OF WATER RESOURCES
388
NTO

November 5, 1964

Honorable Edmund G. Brown, Governor,
and Members of the Legislature
of the State of California

Gentlemen:

I have the honor to transmit Bulletin No. 94-7, "Land and Water Use in Mad River-Redwood Creek Hydrographic Unit", which describes land use, classification of lands, and water use within this hydrographic unit. This report is one of a series of Department of Water Resources reports which will describe similar studies being conducted throughout the State. These studies are being conducted pursuant to legislation sponsored by Senator Edwin J. Regan and codified under Section 232 of the Water Code.

In October 1963 the preliminary edition of this bulletin was released, and in April 1964 its contents were discussed at a public hearing held in Eureka, California. Department personnel studied comments made at this hearing and revised the present edition accordingly.

Bulletins of the No. 94 Series provide information which will be used to estimate the amount of water which can be used beneficially within each area. The amounts of water surplus or deficiency will be determined by comparison of these estimated needs with the local water resources.

Bulletin No. 94-7 will help concerned interests determine future needs for water in the Mad River-Redwood Creek Hydrographic Unit. In addition to basic data on land and water use, there is included a discussion of the history, natural features, climate, and economy of the unit. Maps of present land use and land classification illustrate the text.

Sincerely yours,

William E. Warne

Director

ALIFORNIA—RESOURCES AGENCY
WILLIAM E. WARNE, *Director*

MENT OF WATER RESOURCES
88
O

November 5, 1964

Honorable Edmund G. Brown, Governor,
and Members of the Legislature
of the State of California

Gentlemen:

I have the honor to transmit Bulletin No. 94-7, "Land and Water Use in Mad River-Redwood Creek Hydrographic Unit", which describes land use, classification of lands, and water use within this hydrographic unit. This report is one of a series of Department of Water Resources reports which will describe similar studies being conducted throughout the State. These studies are being conducted pursuant to legislation sponsored by Senator Edwin J. Regan and codified under Section 232 of the Water Code.

In October 1963 the preliminary edition of this bulletin was released, and in April 1964 its contents were discussed at a public hearing held in Eureka, California. Department personnel studied comments made at this hearing and revised the present edition accordingly.

Bulletins of the No. 94 Series provide information which will be used to estimate the amount of water which can be used beneficially within each area. The amounts of water surplus or deficiency will be determined by comparison of these estimated needs with the local water resources.

Bulletin No. 94-7 will help concerned interests determine future needs for water in the Mad River-Redwood Creek Hydrographic Unit. In addition to basic data on land and water use, there is included a discussion of the history, natural features, climate, and economy of the unit. Maps of present land use and land classification illustrate the text.

Sincerely yours,

William E. Warne

Director

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES

EDMUND G. BROWN, Governor
HUGO FISHER, Administrator, The Resources Agency
WILLIAM E. WARNE, Director, Department of Water Resources
ALFRED R. GOLZE, Chief Engineer
JOHN M. HALEY, Acting Assistant Chief Engineer

NORTHERN BRANCH

Stuart T. Pyle	Acting Branch Chief

This report was prepared
under the direction of

Robert E. Foley	Chief, Special Investigations Section

by

C. Wesley York	Senior Engineer

assisted by

Glenn B. Sawyer	Associate Land and Water Use Analyst
Frederick E. Stumpf	Assistant Land and Water Use Analyst
Gardner E. Trefethen	Water Resources Technician II
Price J. Schreiner	Water Resources Technician I

Statewide Aspects of the
Coordinated Statewide Planning Program
are coordinated under the direction of the
Division of Resources Planning

Wesley E. Steiner	Acting Division Engineer
Meyer Kramsky	Chief, Statewide Investigations Branch
Ralph G. Allison	Acting Chief, Planning Investigations Section

CALIFORNIA WATER COMMISSION

RALPH M. BRODY, Chairman, Fresno

WILLIAM H. JENNINGS, Vice Chairman, La Mesa

JOHN W. BRYANT, Riverside
JOHN P. BUNKER, Gustine
IRA J. CHRISMAN, Visalia
JOHN J. KING, Petaluma
EDWIN KOSTER, Grass Valley
NORRIS POULSON, La Jolla
MARION R. WALKER, Ventura

-----0-----

WILLIAM M. CARAH
Executive Secretary

ORVILLE L. ABBOTT
Engineer

ACKNOWLEDGMENT

The Department of Water Resources gratefully acknowledges information contributed by the various water users and residents of the Mad River-Redwood Creek Hydrographic Unit and agencies of the federal, state, and local governments.

Special mention is made of the helpful cooperation of Mr. John Lenz and Mr. Joseph Borden, Farm Advisors of Humboldt and Trinity Counties respectively, for their helpful cooperation in conducting a review of information published herein.

While most of the photographs shown in this report were taken by a photographer of the department, the department expresses its appreciation for the four photographs on pages 6 and 11 to the State Division of Highways, and for the photograph on page 73, bottom, to Eureka Newspapers, Incorporated.

PUBLIC HEARING
on
Preliminary Edition
of
Bulletin No. 94-7
Land and Water Use in Mad River-Redwood Creek Hydrographic Unit

In accordance with Section 232 of the Water Code and the Department of Water Resources' policy, a public hearing was held on April 15, 1964, to receive comments on the preliminary edition of Bulletin No. 94-7, "Land and Water Use in Mad River-Redwood Creek Hydrographic Unit". This hearing was held in the Humboldt County Courthouse, Eureka, California. Mr. Robert E. Foley, assisted by other Water Resources personnel, conducted the meeting. The hearing was attended by 15 members of the public, including local water users, representatives of state and local government agencies, and other interested parties.

The department has conducted further review of the preliminary edition and of verbal comments received at the hearing, and only minor technical and editorial revisions have been made. Copies of the transcript of the hearing are on file with the Department of Water Resources in Sacramento and are available for review by the public.

Verbal comments were made at the hearing by the following persons:

Mr. Albert King, 1705 Glatt Street, Eureka, California

Mr. Robert F. Kelly, Winzler & Kelly Construction Engineers, 730 Fifth Street, Eureka, California.

No written comments pertaining to this report were received by the Department of Water Resources.

CHAPTER I. INTRODUCTION

This bulletin presents basic data on land and water use in portions of Humboldt and Trinity Counties, designated as the Mad River-Redwood Creek Hydrographic Unit. The unit, which is located and outlined on Plate 1, is composed mainly of the watersheds of Mad River and Redwood Creek, but also includes the smaller watersheds of Little River, Maple Creek, and a number of lesser streams flowing directly into the Pacific Ocean. The data include descriptions of systems used to divert water from the various streams in the hydrographic unit, together with histories, apparent water rights data, and purpose and extent of use of each diversion. The data also include monthly quantities of surface water diverted, land use data, and an estimate of total consumptive use of applied water for 1958, and classification of lands in the unit as to suitability for irrigation and for potential recreational development. These data are prefaced by a general description and brief history of the hydrographic unit and immediate vicinity.

These basic data were gathered during the period from 1958 to 1959 in compliance with Chapter 61, Statutes of 1956, as amended by Chapter 2025, Statutes of 1959, and codified in Section 232 of the Water Code of the State of California. This legislation provides for an inventory of water resources and water requirements of the State. This report is the seventh of the series of bulletins to be prepared under this authorization. The text of Section 232, with a discussion of its history and implications, is included in this bulletin as Appendix A.

These data will provide the basis for determination of the quantities of water that are required for potential future uses in the hydrographic unit, the extent to which local water supplies will meet such requirements, and the amounts of water which will be available for export from the various watersheds of the unit. These future determinations will be based on estimates of: (1) projected land use patterns, (2) economic patterns, (3) population, (4) industrial and agricultural development, and (5) recreational needs.

All the investigational work and findings accomplished under the inventory of water resources and water requirements legislation have been and will continue to be closely coordinated with other activities of the Department of Water Resources, the U. S. Bureau of Reclamation, the U. S. Corps of Engineers, and local water agencies.

A major project formulation study program being conducted by the department which pertains directly to the area covered by this report, and which will utilize basic data presented herein, is the North Coastal Area Investigation. This is a comprehensive investigation directed toward the formulation of plans for future water resources projects within the large drainage basins of the North Coastal region from the Russian River on the south to the Smith River on the north. The fundamental objective of this continuing program is the delineation of plans denoting the probable economically optimum development sequence for staged major water resources project units.

In implementation of the California Water Resources Development Act of 1959, the department is required to provide such additional facilities as may be required to meet contractual obligations. These additional conservation facilities will provide for the augmentation of the water supplies to be made available by the State Water Resources Development System as future depletions occur and as future demands increase. Current studies, as well as previous studies made for The California Water Plan, indicate that the rivers of the North Coastal area will best provide these additional large supplies. These projects will be designed to meet future demands for new water service in both local and water deficient areas of the State. Under the multipurpose concept, concurrent consideration is given to protection against recurring floods, development of hydroelectric power and water associated recreational potential, the preservation and possible enhancement of anadromous fisheries, and to a limited extent of water-oriented land management. As listed in Appendix B of this bulletin, a progress report on the North Coastal Area Investigation was published in May 1961.

Certain of the data presented in this bulletin have been reviewed in preliminary form by officials of Humboldt and Trinity Counties and by local water users. Since its organization, the Humboldt County Water Study Committee has been kept informed of the progress and findings of the investigation for this bulletin.

Organization of Report

This bulletin is essentially a compilation of basic data on land use, water use, and land classification, in the form of tables and plates with supplemental explanatory text, and three appendixes containing relevant supplementary data.

Chapter I contains a general description of the history, economy, and natural features of the Mad River-Redwood Creek Hydrographic Unit. Plate 1, prepared in connection with Chapter I, shows the location of the hydrographic unit and of the subunits into which it is divided. Chapter II presents data on surface water diversion systems, including descriptive, historical, water rights and water use data; measurements of quantities of water diverted; and a summary of consumptive use. Chapter III describes the history of land use within the unit, and sets forth in tables the results of a survey of present land use. The 11 sheets of Plate 2, consisting of maps prepared in connection with Chapters II and III, delineate the locations of diversion systems and the areas of various 1958 land uses. Chapter IV includes a tabulation of lands classified with regard to their potential for irrigated agriculture and for recreational purposes. The 11 sheets of Plate 3, consisting of maps prepared for this chapter, delineate the respective classes of land grouped into several major categories. Chapter V summarizes the data presented in the report.

Appendix A presents the text of Section 232 of the California Water Code and a discussion of the pertinent responsibilities and work program of the Department of Water Resources. Appendix B is a bibliography of publications pertinent to the hydrographic unit. Appendix C presents a short summary of California Water Law and a tabulation of applications to appropriate water in the unit.

General Description of Area

The Mad River-Redwood Creek Hydrographic Unit is a narrow land area approximately 90 miles long, with a maximum width of 20 miles and a minimum width of less than 5 miles. The total area of the unit is 929 square miles, of which 770 square miles lie within Humboldt County and 159 square miles lie within Trinity County. The exterior limits of the drainage basins of the Mad River and Redwood Creek virtually delineate the boundaries of the unit. The unit is bordered by the watersheds of the Klamath and Trinity Rivers on the north and east, and those of the Eel and Van Duzen Rivers and Humboldt Bay on the south. The unit boundary representing the southern limit of the Mad River watershed on the coastal plain north of Arcata, appearing on Sheet 5 of Plate 2 and Plate 3, is located along the apparent drainage line as indicated by the topography shown on the U. S. Geological Survey

Eureka quadrangle map, dated 1951, and does not necessarily coincide with delineations used in other studies covering this area.

For purposes of convenience and utility in reporting data, the unit has been subdivided into nine subunits. General locations of these subunits and that of the unit itself are shown on Plate 1. The area of each, by counties as well as by total, is listed in Table 1.

Historical and Present Development

The historical and present development of the Mad River-Redwood Creek Hydrographic Unit cannot be properly discussed without the concurrent consideration of the development of the entire Eureka and Humboldt Bay area. The history of this area, comprising all of Humboldt County and western Trinity County, has been greatly affected by its geographical features. At the beginning, because of the inland mountains, the two available anchorages, Trinidad and Humboldt Bays, were virtually the only routes of access. Because of its greater size and protection as a harbor, and the surrounding area suitable for continued growth, Humboldt Bay soon became the hub of activity. Near its shores, in Eureka and vicinity, the great bulk of the district's population, business, and industry has developed. The two largest communities within the boundaries of the Mad River-Redwood Creek Hydrographic Unit, Blue Lake and the unincorporated community of McKinleyville, are, in fact, extensions of the Humboldt Bay-Eureka development.

Before the coming of the white man, this area was inhabited by Indians. The tribes within the boundaries of the Mad River-Redwood Creek Hydrographic Unit were the Wiyots in the area of the lower Mad River, the Chilulas within the area of lower Redwood Creek, and the Whilkits within the area of the upper Mad River and upper Redwood Creek.

TABLE 1

AREAS OF SUBUNITS IN MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

Subunit	In acres			In square miles		
	Humboldt County	Trinity County	Total	Humboldt County	Trinity County	Total
Beaver	68,370	0	68,370	107	0	107
Big Lagoon	54,020	0	54,020	84	0	84
Blue Lake	41,910	0	41,910	65	0	65
Butler Valley	150,040	9,990	160,030	234	16	250
Little River	29,260	0	29,260	46	0	46
North Fork	29,930	0	29,930	47	0	47
Orick	76,250	0	76,250	119	0	119
Ruth	0	91,350	91,350	0	143	143
Snow Camp	43,290	0	43,290	68	0	68
Total	493,070	101,340	594,410	770	159	929

Shoreline scene
near Trinidad

COASTAL SCENERY DRAWS VACATIONERS

Redwood grove
near the
Coast

Exploration. The adjacent Pacific Ocean provided the means for the white man's discovery of the Humboldt region. The first recorded activity in the area of the Northern California coast was that of the Spanish explorers, Juan Rodriges Cabrillo and Bartolome Ferrelo, in 1542 and 1543. These men explored the area immediately to the south of, but did not actually discover, the Humboldt region itself. Probably the first European explorer to discover the Humboldt region was the famous Sir Francis Drake, in about 1580. In 1775, the Spanish explorers, Juan Francisco de la Bodega and Bruno de Heceta, discovered Trinidad Bay, located at the southern tip of the Big Lagoon Subunit of the Mad River-Redwood Creek Hydrographic Unit. In 1806, Captain Jonathan Winship entered Humboldt Bay, which was later to become the most important center of all development in the entire area.

During the time of Captain Winship, the only economic activities in the area were carried on by fur traders of various nationalities. The discovery of gold in 1848 on the upper Trinity River was a keypoint in the history of Northwestern California. The development of mining in the Trinity region brought about the establishment of supply routes between the mining region and the Humboldt Bay area. The desire to establish a supply route to the Trinity mines brought about intensive exploration of the Humboldt coastal area.

One of the more important expeditions of the day was that led by Dr. Josiah Gregg in 1849 and 1850. Dr. Gregg's party explored the vicinities of Humboldt Bay, the Mad River, Big Lagoon, Little River, and the Eel River. Lack of harmony existed between Dr. Gregg and other members of the party; Dr. Gregg himself was said to have had a bad temper. One day when Dr. Gregg was surveying near the mouth of a river, he spied other members of his party in canoes well out into the stream. Thinking that his party was deserting him, Dr. Gregg made a quick dash for the nearest canoe by wading deep into the cold water. The thorough soaking of himself and his instruments gave strong rise to Dr. Gregg's temper. As a result, the other members of the party were subjected to a violent battery of abusive language. One of the members later wrote, "In commemoration of this we gave the river a name." Thus the Mad River received its name.

Early Development. The year 1850 marks the beginning of the permanent settlements in the region, and several towns came into being in that year. These settlements were the Trinidad Bay settlement; Union Town, later named Arcata; Eureka, the last of the group to be established but later to become the economic center of the entire region; and Bucksport, immediately south of Eureka. Humboldt City, also situated south of Eureka, was rather short-lived. Union Town was the economic center for the period 1850-1856. The only one of these communities which is actually within the Mad River-Redwood Creek Hydrographic Unit is Trinidad.

In 1851 Trinity County, including present Humboldt County, was organized, with Weaverville winning out as county seat. In 1853 the State Legislature divided Trinity County into two parts, designating the western portion as Humboldt County. Union Town, or Union as it was more commonly called, won the first election as county seat. However, Eureka was coming into some prominence, and competition between the two towns was intense. Following a series of contested elections, Eureka finally was designated by the State Legislature as county seat in 1856. This ensured Eureka's future.

At the time of the establishment of these early settlements, the principal contribution to the economy of the region was the packing trade to the Trinity area mines. Whale, shark, and salmon fisheries were flourishing. In 1854, flour and grist mills came into existence. In 1856 it is recorded that the first McCormick reaper was placed in operation. This was in the Hoopa Valley area on the Trinity River. Most important of all, however, was the establishment and rapid growth of the lumber industry in the early 1850's, mainly around Humboldt Bay. This was the start of the most important industry of the Humboldt region.

Resources and Industries. The forest products industry is the backbone of the economy of the hydrographic unit. Seventy-nine percent of the unit's gross area is covered with dense stands of redwood, Douglas fir, pine, and other commercial conifers. The standing timber is estimated to be 20 billion board feet.

Lumber production in the Humboldt Bay area expanded rapidly after the first mill started in 1850, and it has been reported that by 1854 nine sawmills were operating in the area. These mills were mostly in the Eureka area outside the boundaries of the Mad River-Redwood Creek Hydrographic Unit. Probably the first sawmill within the unit was that operated by Baron Karl Von Loeffelholz from about 1850 to 1856, near Trinidad. The succeeding years brought additional mills to various other parts of the unit. The sales of wood products within the boundaries of the unit reached a peak value of 33 million dollars in 1955. A few years later sales value of wood products stabilized at about 29 million dollars per year.

Population growth within the Mad River-Redwood Creek Hydrographic Unit has closely reflected the vicissitudes of the timber industry. This growth was slow and somewhat spasmodic for a long period; but since 1950, there has been a sharp increase, principally in the Humboldt coast portion. The population was about 8,100 in 1950, and had almost doubled by 1960.

The present population of the unit is slightly over 16,000 persons. The population centers are confined to the coastal plains and small valleys, where nearly all the sawmills and intensive farming are located. Developed areas away from the coast are small and scattered.

The major agricultural commodities produced presently are dairy products, horticultural products, and range livestock. The first two of these are produced mainly along the coast. The total production, and consequently the relative importance, of horticultural products -- lilies and cut flowers -- has developed rapidly since 1940. In recent years, the total value of farm products has been around $2,500,000 per year.

In earlier history the port of Trinidad was quite important in commercial fishing activities. It is still of some importance, but now handles only about one-tenth of these activities in Humboldt County; the greater part of this industry in the region now being centered at Eureka, outside the hydrographic unit.

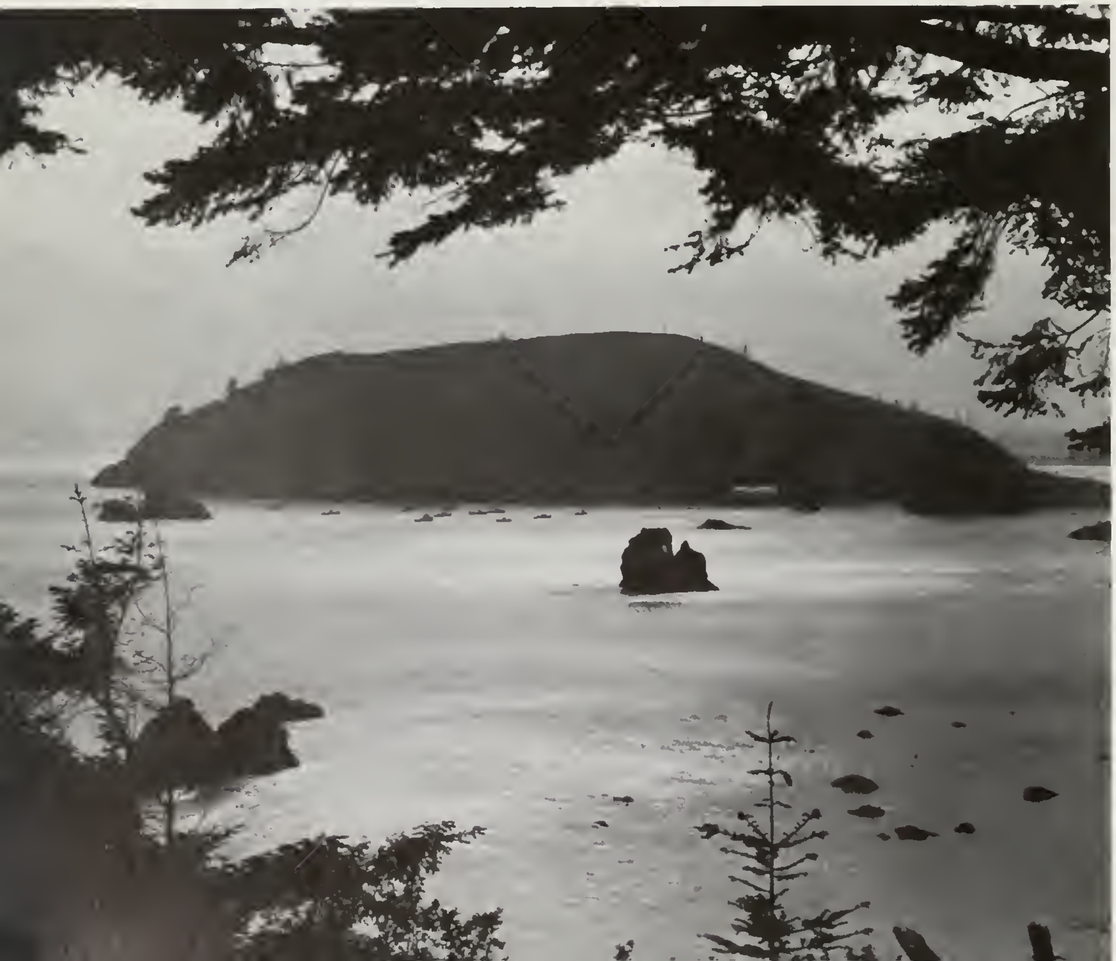
Mineral resources are of a limited nature, with the exception of huge aggregate reserves and small commercial manganese ore deposits. Most of the output of sand and gravel in Humboldt County comes from within the unit area along the lower reaches of the Mad River. The manganese ore bodies are located in the upper Mad River Basin, primarily in Trinity County.

An increasingly important business, and potentially one of the greatest resources, is the recreational activity within the unit. Present recreational activity is mostly confined to the state parks along the coast. However, the rugged back country will become more and more important with the construction of additional development reservoirs, such as Ruth Reservoir.

Water development projects within the unit are the 3,000-acre-foot Sweasey Dam and Reservoir on the lower Mad River, and the newly constructed 52,000-acre-foot Ruth Dam and Reservoir on the upper Mad River. The first provides the water supply for the City of Eureka, and the second will supply the larger industrial water users around Humboldt Bay. The water developed from both of these projects is for export to the Eel River Hydrographic Unit.

Logs from the unit's forests

NATURAL RESOURCES PROVIDE INDUSTRIES



Fishing fleet in Trinidad Bay

The remainder of water development activity is confined to relatively small diverters.

Natural Features

Except for a relatively small coastal plain area and even smaller interior valleys, the terrain of the Mad River-Redwood Creek Hydrographic Unit is composed of steep, and for the most part, inaccessible mountains. The maximum elevation of the unit, near the headwaters of the Mad River, is about 5,000 feet.

The drainage basins of Mad River on the southwest and Redwood Creek on the northeast form the bulk of the hydrographic unit. The Mad River, starting at its source in southern Trinity County, flows almost directly northwest through western Trinity County and across central Humboldt County to the Pacific Ocean. The absence of large tributaries and of main stem forks accounts for the long, narrow drainage basin. The gross area of the basin is approximately 500 square miles. Redwood Creek flows from its source in eastern Humboldt County and follows a course roughly parallel to that of Mad River to reach the Pacific Ocean near the northwest corner of the county. This basin is also long and narrow, and it has a gross area of about 285 square miles. The remainder of the hydrographic unit is composed of the drainage basins of smaller streams flowing directly into the Pacific Ocean between the mouths of the Mad River and Redwood Creek.

Geology.

Rock types which occur in the hydrographic unit are largely sandstone, shale, conglomerate, chert, and greenstone. A large elongated body of mica schist, occurs along the drainage divide between Mad River and Redwood Creek, extending eastward to Redwood Creek in most places. All these rocks are strongly deformed by folding, shearing, and faulting, and are generally deeply weathered at the surface. The predominating northwest drainage pattern is controlled by and aligned with the trends of the principal structural features and stratification of the rock units. Along the coastal portion of the Mad River drainage are younger sediments, including Cenozoic marine formations, alluvium, dune sands, and terrace deposits. The last three of these form part of a principal ground water basin extending southward into the Eel River Hydrographic Unit.

Soils. The soils in this hydrographic unit were formed by two processes: (1) those formed in place on more or less metamorphosed sandstones, shales, conglomerates or intruded igneous rock; and (2) those formed from transported (alluvial) soil material originating from these parent rocks. The first group can be further segregated into two categories: those which were formed under forest cover, and those formed under grass cover. The soils formed from alluvial material can be segregated as those recently formed which lie along existing streams and rivers and those older terrace soils formed from ocean-deposited material.

The soils formed in place from consolidated rock under forest cover have a surface color ranging from brown to reddish-brown and a subsoil color of yellow to yellow-brown. For the most part, they are deep and well drained.

The grassland soils (also called prairie soils) formed from consolidated rock are reddish-brown to dark brownish-gray near the surface and yellow to yellowish-brown in the subsoil. They usually are found to be shallower than the forest covered soils, and occur on gentle slopes such as rounded hilltops.

The soils formed from recently deposited materials range in color from grayish-brown to brownish-gray, and commonly have medium soil texture. Generally, little profile development can be seen. In many cases these soils are subject to frequent flooding or high water table conditions.

The coastal plain soils (also called terrace soils) were formed primarily from ocean-deposited soil material that has been uplifted so that the present relief consists of a series of relatively smooth to gently sloping terraces. The soil texture ranges from fine, sandy loam to silty loam. The surface is usually a reddish-brown color with the subsoil yellowish-brown. Drainage is good, although the subsoil is of a somewhat heavier texture than the surface. In most cases these soils have, or had at one time, a forest cover.

Climate

The climate of the Mad River-Redwood Creek Hydrographic Unit varies from the moderate seasons typical of the Northern California coast to the more variable and generally more extreme seasons common to the higher inland areas. In the lower part of the unit, extending some 25 to 30 miles inland, the predominant influence on the climate is the moist marine air mass, which is moved inland by prevailing onshore winds. The overcast or fog generally associated with this air mass has a great moderating effect on the climate of the coastal area. The more inland part of the unit is enough removed from the oceanic influence, both by elevation and by intervening ridges, to be comparatively free of the moderating effect of the marine air mass. This inland area is subject to a wider range of temperature variation, both daily and seasonal, and a more variable distribution of precipitation than the coastal area.

Average annual precipitation within the unit varies from about 40 inches per year near the mouth of the Mad River to about 90 inches per year in the vicinity of Board Camp Mountain. Over 80 percent of the season's precipitation occurs between November 1 and April 30. In the coastal area, there is generally a measurable amount of precipitation in every month of the year. In the inland part, precipitation usually occurs in all months except July or August, which often have no measurable rainfall. Average snowfall within the unit varies from a negligible amount along the coast to over 4 feet per year at Mad River Ranger Station. The average lowest elevation at which there is snow on the ground on April 1 is about 4,000 feet.

Maximum and minimum recorded seasonal precipitation and estimates of 50-year mean seasonal precipitation at selected stations within or adjacent to the Mad River-Redwood Creek Hydrographic Unit are shown in Table 2. The extremes shown are the highest and lowest seasonal precipitation observed during the period of record indicated for each station. Except for the recorded quantity shown for the Eureka Weather Bureau Station, the 50-year mean seasonal values are estimates of the average depth of rainfall which would have been observed at these stations if they had been in existence during the base period 1905-06 to 1954-55. It is considered that these mean values are representative of the long-term mean seasonal precipitation of the unit.

The climate of the unit is generally illustrated by the temperature data presented in Table 3. These data, with the exception of the frost-free period values, were taken from the "Climatic Summary of the United States -- Supplement for 1931 through 1952," Bulletin W, published by the U. S. Weather Bureau. The values for the frost-free period were derived by the Department of Water Resources, and represent the average

TABLE 2

RECORDED EXTREME AND ESTIMATED MEAN ANNUAL PRECIPITATION AT SELECTED STATIONS IN OR NEAR MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT
(In inches)

Station	Elevation (in feet)	Annual precipitation			Years of record used
		Recorded maximum	Recorded minimum	Estimated 50-year mean	
Alderpoint	435	80.38 (1957-58)	33.84 (1943-44)	47.07	1941 - 1960
China Flat	650	71.32 (1926-27)	22.55 (1923-24)	46.15	1909 - 1954
Crannell	150	77.51 (1937-38)	29.69 (1933-34)	51.96	1933 - 1948
Eureka	43	74.10 (1889-90)	20.72 (1923-24)	36.66	1879 - 1960
Forest Glen	2,340	102.46 (1957-58)	36.59 (1930-31)	57.73	1930 - 1960
Korbel	180	79.96 (1937-38)	36.18 (1946-47)	51.50	1937 - 1960
Mad River Ranger Station	2,775	97.81 (1957-58)	39.35 (1954-55)	55.15	1944 - 1960
Orick - Prairie Creek Park	161	92.88 (1955-56)	46.33 (1946-47)	65.43	1937 - 1960

period between the last day in spring and the first day in the fall when the daily minimum temperature fell to or below 32 degrees Fahrenheit.

TABLE 3

TEMPERATURE DATA AT SELECTED STATIONS
IN OR NEAR MAD RIVER-REDWOOD CREEK
HYDROGRAPHIC UNIT
(In degrees Fahrenheit)

Station	Elevation (in feet)	Average			Extreme		Average daily variation	Frost-free period (in days)
		Jan.	July	Annual	High	Low		
Alderpoint	435	43.9	72.7	58.2	112	16	28.4	202
China Flat	650	41.7	72.7	56.6	113	9	26.3	247
Eureka	43	47.0	55.6	51.6	85	20	10.8	318
Forest Glen	2,340	36.9	68.3	51.6	107	-2	31.7	141
Orick-Prairie Creek Park	161	42.8	59.6	51.9	95	19	18.1	213
Orleans	403	41.5	72.3	56.8	113	14	29.0	222

Water Resources

With the drainage basins of Mad River and Redwood Creek comprising the bulk of the hydrographic unit, the runoff records for these streams provide the basis for a general picture of the unit's surface water supply. There is a gaging station on the lower reaches of each of these streams. The periods of record are relatively short but sufficiently long to present an indication of the supply. A summary of data from these two stations is given in Table 4. For the period June 1 through September 30, 1958, the observed runoff at the Mad River station was 96 percent of the average, and that at the Redwood Creek station, 77 percent.

TABLE 4

SUMMARY OF RUNOFF DATA
MAD RIVER AND REDWOOD CREEK

Item	Mad River near Arcata			Redwood Creek at Orick		
Drainage area: (in square miles)	485			278		
Years of record	13			9		
	Average	Maximum	Minimum	Average	Maximum	Minimum
Runoff: (in acre-feet)						
Seasonal	1,140,000	1,721,000	682,900	774,600	1,174,000	533,200
Monthly	95,000	574,000	1,080	64,500	371,400	972
Discharge: (in cubic feet per second)	1,575	77,800	16	1,070	50,000	10

Local Public Agencies Concerned with Water Development

A number of local public agencies are engaged in water development or related fields within the Mad River-Redwood Creek Hydrographic Unit. Most of these are water service agencies organized to serve domestic and industrial consumers. Among these are three incorporated cities: Blue Lake and Trinidad within the unit; and Eureka, located in the Eel River Hydrographic Unit. The water for these three cities' systems is supplied from surface diversions within the unit. The largest water development agency in and adjacent to the unit is the Humboldt Bay Municipal Water District, which includes portions of both the Eel River and Mad River-Redwood Creek Hydrographic Units. The district's Ruth Dam had not been built in 1958 when diversion data were collected for this report, and hence it is not included.

In addition to these water service agencies, both Humboldt and Trinity Counties, as members of the Eel River Flood Control and Water Conservation Association, participate in the study of water problems of the general area. Humboldt County, acting principally through its Water Study Committee, is particularly concerned with studies directly pertaining to this unit.

CHAPTER II. WATER USE

Present water requirements of the Mad River-Redwood Creek Hydrographic Unit are supplied about 40 percent by diversion of surface runoff, and about 60 percent by pumping of ground water. For this investigation a survey was made of the diversion and use of the water from surface sources. Survey data reported herein include the location and descriptions of diversion systems, their histories, the uses served by them, and the apparent water rights on which they are based. The criterion for inclusion of individual diversions in this report is whether they apparently divert 10 acre-feet or more per year, regardless of the purpose served. Small diversions omitted on this basis were mainly ones which serve only one or a few domestic users.

Quantities of water diverted were measured, where feasible, to provide additional basic data concerning water use which will be helpful in determining water requirements of the unit. A total of 68 diversions were studied, of which 65 were active in 1958; and the quantities diverted at 40 of these 65 were measured. A summary of the diversions classified as to purposes served is given in Table 5. The measured quantities do not necessarily represent average annual quantities for the respective diversions. Rainfall in the unit in 1958 was above normal through April and about normal thereafter. Causes other than weather and runoff conditions, such as economic factors, may also affect the degree to which diversion records represent typical yearly operating practices. Assessment of these factors is beyond the scope of this report. It appears unlikely, however, that water use in the unit was significantly above or below normal. The diversion quantities reported herein generally represent the actual amounts of water taken from the sources, and therefore include recoverable and irrecoverable losses incidental to the water use.

TABLE 5

SUMMARY OF USE AND MEASUREMENT OF SURFACE WATER DIVERSIONS IN MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

(In 1958)

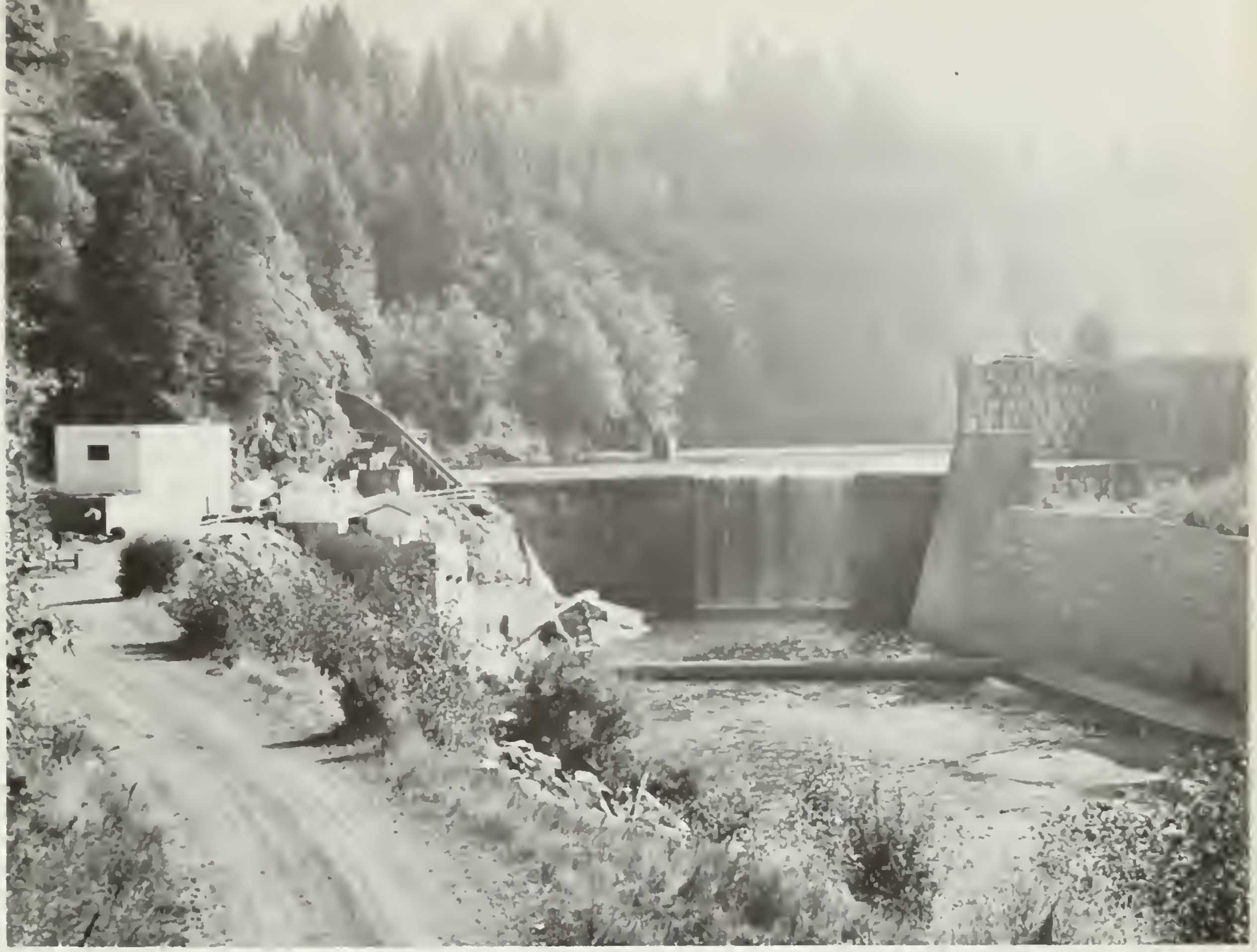
Numbers of diversions			Measurement of diversions	
Total number	Diversions used in 1958	Major purposes	Number of diversions measured	Quantities of water diverted (in acre-feet)
44*	42*	Irrigation and/or stockwatering	32	1,341
8	8	Municipal and/or domestic	2	55
10	10	Industrial	3	197
4	3	Hydroelectric power	2	495
1	1	Recreation and/or fish culture	0	0
1	1	Export to Eureka	1	3,866
68*	65*	TOTALS	40	5,954

* Includes two diversions from which some of the water diverted is exported from the unit.

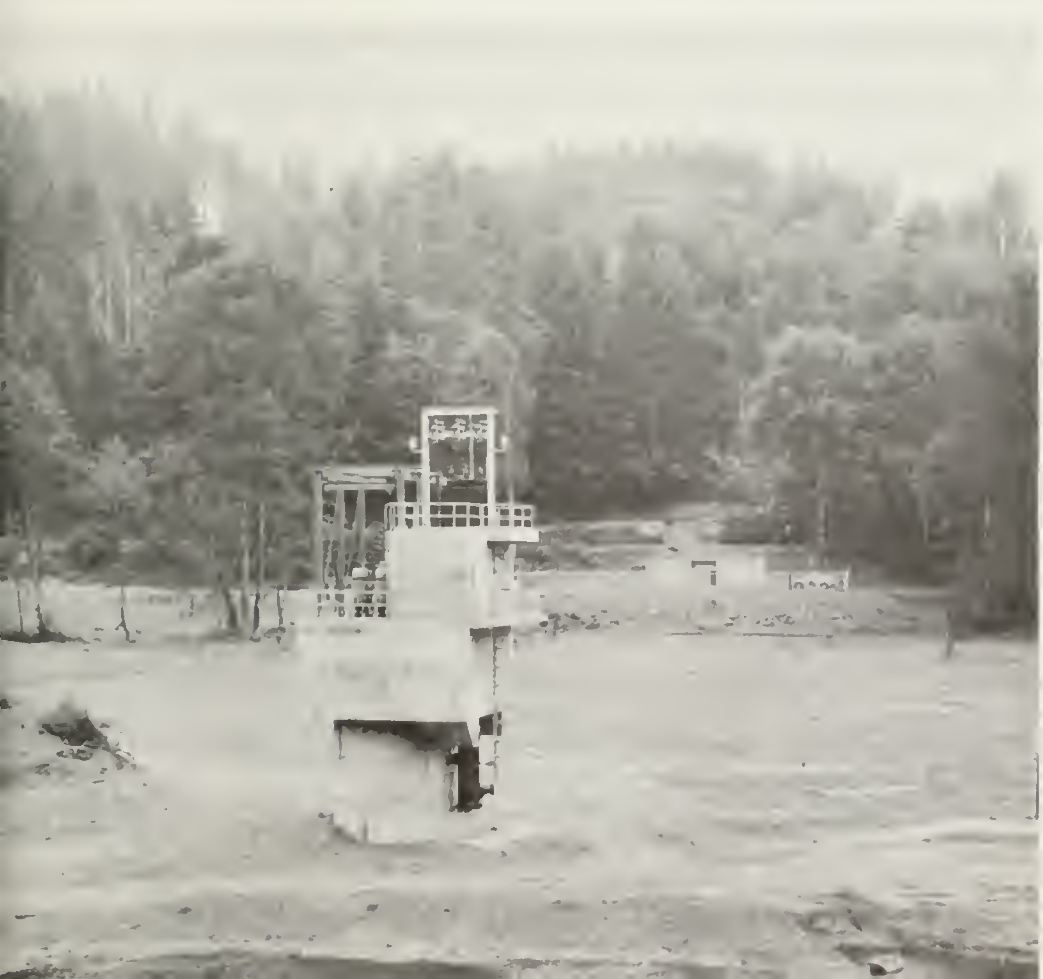
Blue Lake, Crannell, Trinidad, and several other small communities within the unit are supplied from surface water diversions. The Blue Lake and Trinidad systems are municipally owned. Water is also exported from the unit for the City of Eureka from its Sweasey Dam diversion on Mad River. All of the municipal diversions, as well as those for other purposes in existence in 1958, are included in the tabulations in this chapter.

Since a sufficiently accurate estimate of ground water use may be made from unit water use requirements and complete land use data, it was not considered justifiable in this investigation to locate water wells and measure

ey Dam
d River
of
eka
sion
2E-16G1



MUNICIPAL DIVERSION SYSTEMS



Ranney collector
beside Mad
River
Humboldt Bay
Municipal
Water District

their production. The areas of irrigated lands, as well as other land uses, were determined in the land use survey which was also conducted in 1958. This survey and the resulting data are reported in Chapter III.

Water Rights

The data necessary for the determination of the total water requirements of an area must of necessity include the nature and extent of all rights which pertain to the water supply therein. For this reason, data with respect to water rights in general, and particularly those which pertain to the existing surface water diversions, are described in this report.

Most of the surface water use in the unit is based on riparian rights or on appropriative rights established under the provisions of the Water Commission Act of 1914. A few diversions are based on appropriative rights established prior to 1914. These earlier rights were initiated by actual diversion and beneficial use of water, or by posting notice of intended appropriation at the point of diversion and recording such notice in the office of the recorder of the county. No diversions based on court adjudications were noted in this investigation.

As of October 1, 1960, there were on file with the State Water Rights Board 88 applications to appropriate water from the streams of the unit. Of these 88 applications, 84 were for various local uses, amounting to a total of about 30 cubic feet per second of direct diversion,and for storage of 1,625 acre-feet per annum. The other four applications were for major projects not in existence in 1958. Two of these four were held by the California Water Commission under the provisions of Section 10500 of the Water Code for future diversion of 500,000 acre-feet per annum. The other two were held by the Humboldt Bay Municipal Water District and were for diversion of 200 cubic feet per second and for storage of 120,000 acre-feet per annum.

The California Law of Water Rights, as related to both surface and underground water, is described briefly in Appendix C. A tabulation of data relative to the applications on file with the State Water Rights Board is presented in Table C-1 of Appendix C. Data pertaining to the apparent water rights exercised by the diversions described in this report are included in Table 6, described below.

Surface Water Diversions

An attempt was made to locate and obtain data with respect to all diversions of 10 acre-feet or more per year. Since very few diversion systems were previously mapped, an intensive search of the unit by department personnel was necessary. Complete photographic coverage of the unit and a list of appropriate water rights were the chief means of locating diversions. Investigation of visible clues such as conduits, powerlines, and similar features, and of various water-using activities, and canvassing of residents were also of great assistance in the process. As each diversion system was located it was plotted on the photograph covering the site. Descriptions of diversion works were obtained generally through on-the-spot inspection; and other data such as history, uses, water rights, etc., by interviewing the owner, operator, or other persons familiar with the diversions. Certain of these data, such as water rights information, were verified to the extent feasible within the scope of this investigation. U. S. Geological Survey quadrangle maps were used in the field work, and to identify the diversion locations as explained below.

Systems for direct diversion of water, as well as those providing for storage, were located. Systems in use in 1958, and also those used within the previous five years, unless reported to be abandoned, were included. Reservoirs which had surface areas of about three acres or more were mapped. This size was considered the minimum that could be delineated on the aerial photographs used. Reservoirs located along, and operated in conjunction with, ditches and pipelines are shown on the land and water use maps, but are not considered as separate systems nor are they assigned diversion locations. Similarly, points at which diversion conduits intercept minor intermittent streams, and receive small amounts of water in addition to the primary supply, are not considered as separate diversions.

Systems by which diverters collect their own field runoff or spill for reuse are not considered as diversions or assigned diversion locations. If return flow from another water user's operation is rediverted, or if there is doubt as to the origin of the water, the diversion is delineated and assigned a number. Diversion systems of water companies or groups of water users are considered as single units; individual customer distribution points are not shown on the maps.

Diversion points and main ditches or pipelines used to convey water from them are delineated on the 11 sheets of Plate 2, "Land and Water Use." The diversions are listed and described in Table 6.

Location System for Surface Water Diversions

For purposes of identification, each surface water diversion is assigned a location by relating its position plotted on the photograph to the U. S. Geological Survey quadrangle map of the area. These diversion locations include the numbers of the townships, ranges, and sections in the federal land survey system where the diversions apparently are situated. The sections are subdivided into 40-acre plots (quarter-quarter-sections), and the diversion locations also indicate these plots. For example, diversion 6N/1E-15H1, shown on Sheet 5 of Plate 2 labeled "15H1,"

Sprinkler
irrigation
north of
Arcata

AGRICULTURAL WATER USE

Irrigation pump
on Mad River
Diversion
6N/1E-8L1

is in the southeast quarter of the northeast quarter of Section 15, Township 6 North, Range 1 East, Humboldt Base and Meridian (H.B.&M.). A second diversion in a 40-acre plot is distinguished by changing the final number "1" to "2", as for diversion 6N/1E-15H2.

Descriptions of Surface Water Diversions

Descriptions, history, and other information relating to surface water diversions were obtained by field inspection, by interview with water users or their representatives, and by reference to prior reports and official records. This information is summarized in Table 6. Data in the table are arranged by diversion location number within each subunit. Each location number is followed by the name of the owner, the source of water, the purposes served, the quantity of water diverted during 1958, the extent of use, such as the number of acres irrigated and the method of application of water. If the purpose listed is not the usual use for that diversion, notation is made in the "remarks" column. The extent of domestic use is specified only when five or more connections are served. Watering of less than 10 head of livestock is considered to be a domestic use. The extent of irrigation use is based on the land use survey described in Chapter III.

The types of water rights under which the respective diversions are considered to be made are indicated in Table 6 under "apparent water right." Diversions apparently made under rights based on the appropriative doctrine (see Page C-5, Appendix C) are listed as "appropriative." Those diversions for which the conditions for riparian use, also described in Appendix C, apparently prevail, but for which no appropriation was known to exist, are listed as "riparian." Diversions listed as appropriative may also be riparian, although no attempt was made in such cases to determine the riparian status.

The actual amount of the right, if established and known, and a reference to the source of the data, are also included under "apparent water right." In the case of an appropriative right, the amount tabulated is that found in the filing, if any, or in the application, or in the latest permit or license which may have been issued in connection with the application. The reference given for an appropriation initiated after the effective date of the Water Commission Act of 1914 is the number of the application on file with the State Water Rights Board. For an appropriation made prior to 1914, the reference, if known, is the book and page number of the official records of the county in which the diversion is located. Although the "miners inch" is now legally 1/40 cubic foot per second, county records reveal that many of the filings made prior to 1914 specified a four inch head (1/50 cubic foot per second). As many filings did not specify, no attempt was made to differentiate between the miners inches claimed.

The determination of water rights under which the various diversions are made is based upon the best information available from the owner, from files of the State Water Rights Board and other official records, and from other sources. Although this information is believed to be accurate, it is emphasized that it is not based on sworn claims or testimony, and should in no way be construed to represent a conclusive determination of water rights.

Detailed descriptions of the diversion systems, including dams, pumps, and main conduits, as well as any special features, are also given in Table 6. The diversion systems are classified as to type - gravity, pump, or storage - according to the following definitions:

> Gravity diversion - A system in which water is taken from its natural course at a diversion structure and conveyed by gravity through a canal or pipeline to the area of use. Such a diversion may have a reservoir on the stream, but the capacity is small compared with the amount of water diverted and provides no significant carryover storage from winter to summer.

TABLE 6

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion location and Plate 2 sheet number	Diversion name and/or owner	Source	Water use in 1958			Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount	Reference			
H B & M						Beaver Subunit					
7N/3E-5L1 (Sheet 4)	United States Plywood Corp.*	Beaver Creek	Indust.	(*)	Not meas.	(c)	--	--	About 1953	Gravity; 500 feet of 6-inch pipe and 2,500 feet of flume to log pond.	Former owner: Mutual Plywood Company. Sold to United States Plywood Corp. in 1958. Supplements log pond 7N/3E-6K1.
7N/3E-5L2 (Sheet 4)	United States Plywood Corp.*	Beaver Creek	Domestic	15 connections	Not meas.	Riparian	--	--	About 1953	Gravity; 2,200 feet of 3-inch pipe to 5,000-gallon storage tank.	Former owner: Mutual Plywood Company. Sold to United States Plywood Corp. in 1958.
7N/3E-6K1 (Sheet 4)	United States Plywood Corp.*	Redwood Creek	Indust.	Lumber mill and 10-acre log pond*	89	(c)	--	--	1953	Pump; 30-hp electric motor with about 1,000 feet of 5-inch pipe to log pond.	Former owner: Mutual Plywood Company. Sold to United States Plywood Corp. in 1958. Log pond supplemented by 7N/3E-5L1.
						Big Lagoon Subunit					
8N/1E-31D1 (Sheet 3)	Elgin O. Edeline	Luffenholtz Creek	Power	(*)	None	Approp.	1.13 cfs	A-11039[a]	About 1850	Gravity; gravel dam 1 foot high, 20 feet long, with 50 feet of earth ditch and wood flume to water wheel.	Former owner: Baron Karl Von Loeffelholz, Herman Gastman.* Formerly used to operate sawmill; now maintained as a standby system for power generation.
8N/1W-14K1 (Sheet 3)	California State Department of Natural Resources; Division of Forestry	Tributary to Pacific Ocean	Domestic Fire prot.	5 connections 15 fire trucks	Not meas.	Approp.	0.035 cfs	A-14216[a]	1951	Pump; 1.5-hp electric motor with 800 feet of 2-inch pipe to 5,000-gallon storage tank.	
8N/1W-23H1 (Sheet 3)	City of Trinidad	Mill Creek	Municip.	100 connections	37	Approp.	0.17 cfs	A-17662[a]	About 1900	Pump; earth dam 10 feet high, 30 feet long, with 7.5-hp electric-powered pump and 3,300 feet of 4-inch pipe to 20,000- and 100,000-gallon storage tanks.	Former owner: Charles Kelstrom.
9N/1E-19G1 (Sheet 2)	Georgia Pacific Corporation; Hammond-California Redwood Division	Oray Creek	Indust.	780-acre-foot log pond	Not meas.	Approp.	1.0 cfs 780 af storage	A-12959[a]	1947	Storage; earth dam 15 feet high, 1,770 feet long.	Former owner: Hammond Lumber Company.
9N/1W-26L1 (Sheet 2)	George McAllister	Tributary to Pacific Ocean	Irrig.	9 acres by sprinkler	12	Riparian	--	--	1948	Gravity and pump; earth and log dam 10 feet high, 50 feet long, with 5-hp electric-powered pump and 500 feet of 3-inch pipe to distribution system.	
10N/1E-29F1 (Sheet 1)	William McNeil	Tributary to Stone Lagoon	Irrig.	56 acres by sprinkler*	Not meas.	Riparian	--	--	Prior 1919	Pump; 5-hp electric motor with direct connection to distribution system.	Former owners: Diez, Pialarsey, Horn. Area irrigated received supplemental supply from ground water.
10N/1E-29L1 (Sheet 1)	William McNeil	McDonald Creek	Irrig. Stock.	24 acres by sprinkler* 83 head	34	Riparian	--	--	Prior 1935	Pump; 5-hp electric motor with direct connection to distribution system.	Area irrigated received supplemental supply from ground water.

* See remarks.
For lettered footnotes, see last page of table.
-- Information not available.

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion location and Plate 2 sheet number	Diversion name and/or owner	Source	Water use in 1957			Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount	Reference			
H B & M						Blue Lake Subunit					
6N/1E-6Q1 (Sheet 5)	Joe W. Bugenig	Morris Creek	Irrig.	27 acres by sprinkler	16	Riparian	--	--	1954	Pump; 15-hp electric moto, with 1,600 feet of 4-inch pipe to distribution system.	
6N/1E-7J1 (Sheet 5)	William F. Silva	Mad River	Irrig.	95 acres by flooding	88	Approp.	0.8 cfs	A-7476[a]	1919	Pump; 15-hp electric motor and distribution system which includes 5,000 feet of 12-inch concrete main.	Former owners: Domingo Silva, Sr. Domingo Silva, Jr.
6N/1E-7L1 (Sheet 5)	Mary Pifferini, et al.	Mad River	Irrig.	38 acres by flooding*	Not meas.	Approp.	0.17 cfs	A-7713[a]	1923	Pump; 5-hp electric motor and distribution system which includes 1,500 feet of 6-, 8-, and 12-inch main.	Former owner: Claudio Pefferini. An additional 2 acres, previously irrigated, were idle or fallow in 1958.
6N/1E-7R1 (Sheet 5) (Export)*	Marion J. Rorton	Mad River	Irrig.	4 acres by sprinkler	Not meas.*	Riparian	--	--	1922	Pump; 20-hp electric motor, with short pipeline to distribution system.	Former owner: William W. Turner. Portion of amount diverted used to irrigate an additional acreage in the Eel River Hydrographic Unit.
6N/1E-8L1 (Sheet 5) (Export)*	Manuel Santos	Mad River	Irrig.	34 acres by sprinkler	Not meas.*	Riparian	--	--	Prior 1941	Pump; 20-hp electric motor with direct connection to portable system.	Portion of amount diverted used to irrigate an additional acreage in the Eel River Hydrographic Unit.
6N/1E-9R1 (Sheet 5)	Earl C. Johnson	Spring tributary to Mad River	Irrig.* Domestic	5 acres by sprinkler (b)	Not meas.	Riparian	--	--	Prior 1921*	Gravity; wood diversion structure with short pipeline to distribution system. Separate 0.4 mile pipeline serves domestic users.	Former owners: McConnaghy, Pete Johnson. Irrigation use began in 1958.
6N/1E-11A1* (Sheet 5)	G. F. Timmons and Son	Grassy Creek	Irrig.	(*)	None	Riparian	--	--	Prior 1941	Pump; 30-hp butane engine with short pipeline to sprinkler distribution system.	Portable pump location varies within 600 feet of location indicated. Previously irrigated 45 acres and watered a variable number of livestock.
6N/1E-11C1* (Sheet 5)	G. F. Timmons and Son	Lindsay Creek	Irrig. Stock.	36 acres by sprinkler 340 head	11	Riparian	--	--	Prior 1941	Pump; 30-hp butane engine with short pipeline to distribution system.	Portable pump location varies within 800 feet of location indicated.
6N/1E-14B1 (Sheet 5)	Essex Mill Pond O. F. Timmons and Son	Springs tributary to Lindsay Creek	Indust.	150-acre-foot log storage pond*	Not meas.	(c)	--	--	Prior 1954	Gravity; earth dam 6 feet high, 3,000 feet long, with 150-acre-foot log pond.	Occasionally supplemented by a pump from Lindsay Creek.
6N/1E-15R1 (Sheet 5)	Mercer-Fraser Co.	Mad River	Indust.	Gravel washing	70	Riparian	--	--	About 1930	Pump; 20-hp electric motor with short pipeline to plant.	
6N/1E-15R2 (Sheet 5)	Mercer-Fraser Co.	Mad River	Indust.	Gravel washing	Not meas.	Riparian	--	--	About 1930	Pump; 10-hp electric motor with short pipeline to plant.	
6N/1E-24G1 (Sheet 5)	A. W. Christie	Mad River	Irrig.	85 acres by sprinkler	86	Riparian	--	--	1943	Pump; 20-hp electric motor with direct connection to distribution system.	

* See remarks.
For lettered footnotes, see last page of table.
-- Information not available.

TABLE 6 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion location and Plate 2 sheet number	Diversion name and/or owner	Source	Water use in 1957			Apparent water right			Indicated date of appro-priation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount	Reference			
R B & M						Blue Lake Subunit (Continued)					
6N/1E-24G2 (Sheet 5)	A. W. Christie	Mad River	Irrig.	109 acres by sprinkler	73	Riparian	--	--	1943	Pump; two 15-hp electric motors with direct connection to distribution system.	
6N/2E-31H1 (Sheet 5)	Melvin P. Roberts, Jr.	Mad River	Irrig. Stock.	43 acres by sprinkler 50 head	72	Approp.	0.73 cfs	A-17996^a	Prior 1952	Pump; 15-hp electric motor with direct connection to distribution system.	
6N/1W-1B1 (Sheet 5)	James R. Werner	Mad River Lagoon	Irrig.	5 acres by sprinkler	6	Riparian	--	--	1944	Pump; 5-hp electric motor with 0.25 mile of 4-inch pipe to distribution system.	Former owner: Benry Werner.
7N/1E-17E1 (Sheet 4)	Alfred W. Thoma	South Fork Patrick Creek	Irrig. Domestic	27 acres by sprinkler (b)	7	Approp.	0.18 cfs	A-11510^a	1946	Pump; concrete dam 3 feet high, 50 feet long, and 7.5-hp electric-powered pump with 600 feet of 6-inch pipe to distribution system.	
7N/1E-17R1 (Sheet 4)	T. George Everett	Springs tributary to Strawberry Creek	Irrig. Stock.	38 acres by sprinkler 17 head	15	Riparian	--	--	1946	Pump; 5-hp electric motor with direct connection to distribution system.	
7N/1E-17R2 (Sheet 4)	Albert R. and John R. Forrest	Tributary to Strawberry Creek	Irrig. Stock.	43 acres by sprinkler 45 head	36	Approp.	0.28 cfs	A-15085^a	1952	Gravity and pump: earth dam 16 feet high, 200 feet long, with 4.5 acre-foot regulatory reservoir, and two 7.5-hp electric-powered pumps and distribution system which includes 600 feet of 4-inch main.	
7N/1E-18B1 (Sheet 4)	Renrietta Rartman	Patrick Creek	Irrig. Stock.	130 acres by sprinkler* 45 head	14	Approp.	0.9 cfs	A-11185^a	1945	Pump; 30-hp electric motor and sprinkler distribution system which includes 0.7 mile of 6-inch main.	Former owner: Alfred Reimann. An additional 4 acres, previously irrigated, were idle or fallow in 1958.
7N/1E-18H1 (Sheet 4)	Edward C. Bott	Patrick Creek	Irrig.	78 acres by sprinkler	51	Approp.	0.24 cfs	A-14519^a	1951	Pump; concrete dam 4 feet high, 25 feet long, with 20-hp electric-powered pump with direct connection to distribution system.	
7N/1E-18K1 (Sheet 4)	Oscar N. Kuntz	Strawberry Creek	Irrig.	55 acres by sprinkler	24	Riparian	--	--	1945	Pump; 25-hp electric motor with 400 feet of 6-inch pipe to distribution system.	Former owners: John Colyer, Clough.
7N/1E-27A1 (Sheet 4)	Jess A. Luster	Mather Creek	Irrig. Stock.	12 acres by sprinkler 40 head*	30	Approp.	0.14 cfs*	A-15328^{a*}	1953	Pump; 9-hp gasoline engine with direct connection to distribution system.	Stockwatering use supplemented by 7N/1E-27H1 and 7N/1E-27R1. All three diversions covered by same application for total of 0.14 cfs.

* See remarks.
For lettered footnotes, see last page of table.
-- Information not available.

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion location and Plate 2 sheet number	Diversion name and/or owner	Source	Water use in 1957			Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount	Reference			
R B & M						Blue Lake Subunit (Continued)					
7N/1E-27H1 (Sheet 4)	Jess A. Luster	Lindsay Creek	Irrig. Stock.	25 acres by sprinkler (*)	13*	Approp.	0.14 cfs	A-15328[a]*	1953	Same system as above.	Portion of amount diverted supplements stockwatering use of 7N/1E-27A1. 7N/1E-27A1, 7N/1E-27H1 and 7N/1E-27R1 covered by same water right application for total of 0.14 cfs.
7N/1E-27R1 (Sheet 4)	Jess A. Luster	Lindsay Creek	Irrig. Stock.	14 acres by sprinkler (*)	Not meas.*	Approp.	0.14 cfs	A-15328[a]*	1953	Same system as above.	Same as above.
7N/1E-28D1 (Sheet 4)	Julius M. Rooven	Duke Creek	Irrig. Stock.	16 acres by sprinkler* 1,250 head	12	(c)	--	--	1945	Storage and pump; earth dam 50 feet high, 50 feet long, with 20-hp electric-powered pump and 5,500 feet of 6-inch pipe to distribution system.	An additional 68 acres, previously irrigated, were idle or fallow in 1958.
7N/1E-29B1 (Sheet 4)	Humboldt County Division of Aviation	Norton Creek	Municip. Stock.	250 persons 100 head	18	(c)	--	--	1942	Gravity; concrete dam 2 feet high, 5 feet long, with 1.0 mile of 6-inch pipe to 20,000- and 100,000-gallon storage tanks.	Former owner: United States Navy.
7N/1E-30J1 (Sheet 4)	Hans Dudal	Norton Creek	Irrig.	16 acres by sprinkler	Not meas.	Riparian	--	--	Prior 1938	Gravity; small earth dam with short pipeline to distribution system.	Former owners: Axe, Pete Roesen.
7N/1E-30Q1 (Sheet 4)	Henry L. Sorensen	Norton Creek	Irrig.	30 acres by sprinkler	15	Riparian	--	--	About 1930	Pump; 5-hp electric motor with direct connection to distribution system.	Former owner: Edward Nelson.
7N/1E-31C1 (Sheet 4)	John D. Daily	Widow White Creek	Irrig.	7 acres by sprinkler	Not meas.	Approp.	0.05 cfs	A-10351[a]	1936	Pump; 5-hp electric motor with 550 feet of 3-inch pipe to distribution system.	
7N/1E-32F1 (Sheet 4)	Carl Martin	Widow White Creek	Irrig. Stock.	4 acres by sprinkler 12 head	Not meas.	Approp.	0.03 cfs	A-10317[a]	1941	Pump; 7.5-hp electric motor with 650 feet of 4-inch pipe to distribution system.	
7N/1E-34A1 (Sheet 4)	Carroll Hauser	Lindsay Creek	Irrig.	(*)	None	Riparian	--	--	1951	Pump; 20-hp gasoline engine with direct connection to distribution system.	Previously irrigated 21 acres and watered 50 head of livestock.
7N/1W-25J1 (Sheet 4)	Albert C. Hartman	Widow White Creek	Irrig.	36 acres by sprinkler*	10	Riparian	--	--	Prior 1947	Pump; 15-hp electric motor with 0.5 mile of 4-inch pipe to distribution system.	Former owner: A. A. Werner. An additional 8 acres, previously irrigated, were idle or fallow in 1958.
						Butler Valley Subunit					
3N/3E-3F1 (Sheet 8)	Roy Fulton	Tributary to Mad River	Irrig. Stock.	3 acres by sprinkler 600 head	Not meas.	(c)	--	--	About 1944	Storage and pump; earth dam 15 feet high, 400 feet long, with 4-hp gasoline-powered pump and short pipeline to distribution system.	Former owner: Wycoff.

* See remarks.
For lettered footnotes, see last page of table.
-- Information not available.

TABLE 6 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion location and Plate 2 sheet number	Diversion name and/or owner	Source	Water use in 1958			Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount	Reference			
H B & M						Butler Valley Subunit (Continued)					
4N/3E-6H1 (Sheet 7)	Addison Dam Roddiscraft, Inc.	Boulder Creek	Indust.	Lumber mill and 85-acre-foot log pond	Not meas.	Approp. Approp.*	0.12 cfs 85 af storage	A-14063[a] A-14257[a]*	1946	Storage and pump: concrete dam 43 feet high, 92 feet long, with 85-acre-foot log pond and two 30-hp electric-powered pumps with short pipelines to mill area.*	Former owners: Addison Brothers, Humboldt Lumber Corporation. System removed and use discontinued in 1959. Appropriative right to store water revoked January 1960.
4N/3E-21C1 (Sheet 7)	Dr. C. G. Wiggins, et ux.	Spring tributary to Mad River	Irrig. Power	10 acres by sprinkler 0.9 kw installed generating capacity	Not meas.	(c)	--	--	1952	Storage and pump; earth dam 25 feet high, 300 feet long, with 10-hp electric-powered pump and 300 feet of 3-inch pipe to area of use.	
5N/2E-16G1 (Sheet 6) (Export)*	Sweasey Dam City of Eureka	Mad River	Export*	(*)	3,866	Approp.	7.74 cfs 750 af storage	A-7621[a]	1933	Storage and gravity; concrete dam 105 feet high, 260 feet long, with 3,000-acre-foot reservoir and 24- and 36-inch pipelines to Eureka.	Water exported outside of Mad River-Redwood Creek Hydrographic Unit for use in City of Eureka.
5N/2E-36P1 (Sheet 6)	Lois Speier	Mad River	Irrig. Stock.	109 acres by sprinkler* 230 head	90	Riparian	--	--	1948	Pump; 25-hp electric motor and sprinkler distribution system which includes 2,700 feet of 6-inch main.	Former owner: G. L. Speier. Area irrigated received supplemental supply from 5N/2E-36Q1.
5N/2E-36Q1 (Sheet 6)	Lois Speier	Mad River	Irrig.	(*)	90*	Riparian	--	--	1948	Pump; 40-hp electric motor and sprinkler distribution system which includes 3,200 feet of 6-inch main.	Former owner: G. L. Speier. Amount diverted supplements 5N/2E-36P1. Extent of use reported under 5N/2E-36P1.
						Little River Subunit					
7N/1E-8C1 (Sheet 4)	John Christie	Little River	Irrig. Stock.	80 acres by sprinkler 75 head	172	Riparian	--	--	Prior 1948	Pump; 10- and 15-hp electric motors and distribution system which includes 1,300 feet of 6-inch main.	Former owner: Martin Peters.
7N/1E-8E1 (Sheet 4)	Dr. Sanford M. Moose	Spring tributary to Little River	Irrig. Stock.	15 acres by sprinkler 25 head	4	Riparian	--	--	1951	Pump; 5-hp electric motor with short pipeline to collection pond also fed by springs, and booster pump with 1,000 feet of 4-inch pipe to area of use.	
7N/1E-8F1 (Sheet 4)	Dr. Sanford M. Moose	Little River	Irrig.	99 acres by sprinkler	92	Riparian*	--	--	Prior 1950	Pump: 15-hp electric motor with short 6-inch pipeline to distribution system.	Insufficient information to determine type of water right for portion of area irrigated.
7N/1E-8G1* (Sheet 4)	John E. Balke	Bulwinkle Creek	Irrig. Stock.	16 acres by sprinkler* 50 head	12	Riparian	--	--	1943	Pump; 25-hp gasoline engine with direct connection to portable sprinkler system.	Mobile pump location varies within 1,000 feet of location indicated. An additional 4 acres, previously irrigated, were idle or fallow in 1958.
7N/1E-8G2 (Sheet 4)	John E. Balke	Little River	Irrig.	8 acres by sprinkler	3	Riparian	--	--	1943	Pump; 25-hp gasoline engine with direct connection to portable sprinkler system.	

* See remarks.
For lettered footnotes, see last page of table.
-- Information not available.

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion location and Plate 2 sheet number	Diversion name and/or owner	Source	Water use in 1958			Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount	Reference			
H B & M						Little River Subunit (Continued)					
7N/1E-8R1 (Sheet 4)	Uno Nylender* Cottage Gardens Company, Inc., lessee	Pulwiokle Creek	Irrig.	54 acres by sprinkler	45	Approp.*	0.19 cfs	A-13693[a]	1950	Gravity and pump; wood dam 3 feet high, 15 feet long, with streamside sump and 15-hp electric-powered pump with 0.3 mile of pipe to pond at area of use.	Water right is in name of Davis S. Ward, President of Cottage Gardens Company, Inc., lessee.
8N/1E-32M1 (Sheet 3)	Rowena J. Townsend	Tributary to Pacific Ocean	Municip.*	105 connections*	Not meas.	Approp.	31,000 gpd	A-7703[a]	About 1930	Pump; 1.5-hp electric motor with about 600 feet of 2-inch main to service area.	Former owners: Anna M. Sullivan, W. L. Townsend. Supplies communities of Moonstone Beach, South Trinidad, and Westhaven; not as a public utility, but with surplus water only.
8N/1E-33K1 (Sheet 3)	Georgia Pacific Corp.; Hammond-California Redwood Division	Freeman Creek	Municip. Indust.	135 connections* (*)	Not meas.	Riparian	--	--	1920	Gravity; earth and log dam 6 feet high, 25 feet long, with 1.8 miles of 4- to 8-inch pipe to distribution system.	Former owner: Little River Lumber Company. Supplies town of Crannell and an estimated 50,000 gallons per day for brake coolant, etc., for logging operations.
						North Fork Subunit					
6N/2E-21C1 (Sheet 5)	City of Blue Lake	Spring tributary to North Fork Mad River	Municip.	400 connections*	Not meas.	Approp.	0.045 cfs 21,000 gpd	A-10097[a] A-12233[a]	Prior 1930	Gravity; with 1.3 mile of 2- to 4-inch pipe to three 50,000-gallon storage tanks.	Service area received supplemental supply from ground water.
6N/2E-28L1 (Sheet 5)	Simpson Redwood Co.	North Fork Mad River	Indust.	Lumber mill	38	Riparian	--	--	About 1896	Pump; 25- and 5-hp electric motors with a short pipeline to area of use.	Former owners: Korbel Brothers, Northern Redwood Company.
6N/2E-28M1 (Sheet 5)	Simpson Redwood Co.	Tributary to North Fork Mad River	Indust.	2-acre log pond	Not meas.	(c)	--	--	About 1900	Gravity; with 500 feet of 30-inch pipe to log pond.	Former owners: Korbel Brothers, Northern Redwood Company.
7N/3E-31C1 (Sheet 4)	Harold Preston* California State Division of Highways, lessee	Tributary to Long Prairie Creek	Domestic	100 persons	Not meas.	Approp.*	0.031 cfs	A-16756[a]	1955	Gravity; concrete dam 4 feet high, 15 feet long, with 4,800 feet of 4-inch pipe to area of use.	Appropriative water right is in name of State of California Division of Highways.
						Orick Subunit					
11N/1E-22K1 (Sheet 1)	Robert S. Davison	Prairie Creek	Irrig. Stock.	68 acres by sprinkler 75 head	24	Riparian	--	--	About 1925	Pump; 10-hp electric motor with direct connection to distribution system.	Former owner: Arthur S. Davison.
11N/1E-23A1 (Sheet 1)	California State Department of Fish and Game* Humboldt County, lessee	Lost Man Creek	Fish culture	Raising fish for stock	Not meas.	Approp.	1.86 cfs	A-8391[a]	1935	Gravity; concrete and board dam 6 feet high, 60 feet long, with 0.6 mile of 12-inch pipe to hatchery.	Ownership transferred to Humboldt County after 1958.
11N/1E-27Q1 (Sheet 1)	Arcata Redwood Company; Hill Davis	Prairie Creek	Irrig.* Stock.*	29 acres by sprinkler 52 head	51	Riparian	--	--	1947	Pump; 25-hp electric motor with direct connection to distribution system.	Agricultural activities replaced by a lumber mill after 1958.

* See remarks.
For lettered footnotes, see last page of table.
-- Information not available.

TABLE 6 (Continued)

DESCRIPTIONS OF SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion location and Plate 2 sheet number	Diversion name and/or owner	Source	Water use in 1957			Apparent water right			Indicated date of appropriation or first use	Description of diversion system	Remarks
			Purpose	Extent and method of use	Amount diverted in acre-feet	Type	Amount	Reference			
H B & M						Ruth Subunit					
2S/7E-2F1 (Sheet 10)	Aubert N. and Mary Lou Jeans	Middle Fork Bobart Creek	Power Irrig. Domestic	3 kw capacity 4 acres by sprinkler (b)	275	Approp.	200 MI 300 MI	Book 1^d page 162 Book 1^d page 163	1889	Gravity; earth and rock dam with 0.8 mile of earth ditch and natural channel and 450 feet of 6-inch pipe to area of use.	Former owners: A. H. Marshall, Arthur H. and John H. Jeans. Occasionally supplemented by ditches from east branch of Bobart Creek. The lands irrigated by this diversion are within the high-water line of Ruth Reservoir now under construction.
2S/7E-3A1 (Sheet 10)	Anna Terral	Springs tributary to Chopiotoy Creek	Power Irrig. Domestic	3.5 kw capacity 4 acres by sprinkler (b)	220	Approp.	100 MI	Book 3^d page 34	1900	Gravity; wooden head box with 740 feet of 5-inch pipe to area of use.	Former owners: Roy A. Parker, Robbins.
2S/7E-4C1 (Sheet 10)	Earl P. Dillon	Mad River	Irrig.	9 acres by sprinkler*	10	Riparian	--	--	Prior 1958	Pump; 5-hp gasoline engine with direct connection to portable sprinkler system.	Former owners: McKnight, Strickland. This pump used at 3 points of diversion on the Mad River. The lands irrigated by this diversion are within the high-water line of Ruth Reservoir now under construction. An additional 14 acres, previously irrigated, were idle or fallow in 1958.
2S/7E-23J1 (Sheet 10)	Roy Gallagher and Glen Rector	Tompkins Creek	Irrig. Stock. Domestic	9 acres by sprinkler 25 head (b)	123	Approp.	100 MI	Book 2^d page 440	Prior 1904	Storage and gravity; earth and rock dam 15 feet high, 220 feet long, with 0.5 mile of earth ditch to a 5 acre-foot reservoir.*	Former owners: Tompkins, Ed Link, C. R. McGill. New ditch and reservoir activated in September 1958.
3S/8E-6A1 (Sheet 10)	Six Rivers Pine Sales (Lester J. Geijsbeek, et al.)	Mad River	Indust	Small log pond	Not meas.	(c)	--	--	About 1944	Pump; 15-hp electric motor with about 400 feet of 6-inch pipe to log pond.	Former owner: Dolan.
						Snow Camp Subunit					
					(No diversions located in this subunit)						

* See remarks.
-- Information not available.
a - Refers to applications to appropriate water filed with State Water Rights Board.
b - Domestic use by less than 5 families or connections.
c - Insufficient information to determine type of water right.
d - Trinity County records.

Pump diversion - A system in which water is pumped from its natural course through a pipeline to the area of use or to a gravity conduit located at a higher elevation.

Storage diversion - A system consisting of, or including, a surface reservoir having significant carryover storage within each season or from season to season.

Systems not exclusively of one of these basic types are listed as combinations of those types which best describe them.

The "remarks" column contains such information as the names of former owners, known changes of ownership after 1958, and further details explaining entries in the other columns.

Records of Surface Water Diversions

Continuous or periodic measurements of the quantities of surface water diverted by 40 of the 65 diversions in use in the unit were made by the Department of Water Resources in 1958. Detailed results of the measurement program are reported in Table 7.

Determinations of diverted quantities were made primarily by testing of pumps. These observations were supplemented by interviews of water users to obtain data on possible abrupt changes in operation between readings, periods of operation, etc.

For each diversion measured, Table 7 gives the use, the point and method of measurement, and the monthly and total quantities diverted. Notations in the "use" column regarding the irrigation period indicate the overall period of irrigation, but not necessarily that daily or continuous irrigation was practiced throughout the period. The quantities given in the table are based on various methods listed in the column "Method of observation and calculations." Where monthly data were sufficiently reliable, the quantities are shown. When the diversion during a month is

TABLE 7

MONTHLY RECORDS OF SURFACE WATER DIVERSIONS
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT
1958

Diversion location	Diversion name or owner	Use	Point of measurement or estimate	Method of observation and calculation	Amount diverted, in acre-feet													Remarks
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	
H B & M					Beaver Subunit													
7N/3E-6K1	United States Plywood Corp.	Industrial	At pump	Pump test and power records	0	0	0	0	0	1	8	39	18	12	6	5	89	
					Big Lagoon Subunit													
8N/1W-23H1	City of Trinidad	Municipal	At pump	Pump test and power records	2	2	2	3	4	5	6	4	3	2	2	2	37	
9N/1W-26L1	George McAlister	Irrigation 6/9/58 - 9/6/58	At pump	Pump test and operation record	0	0	0	0	0	3	3	5	1	0	0	0	12	
10N/1E-29L1	William McNeil	Irrigation and stockwatering	At pump	Pump test and power records	0	0	0	1	2	8	11	10	1	1	0	0	34	
					Blue Lake Subunit													
6N/1E-6Q1	Joe W. Bugenig	Irrigation 8/14/58 10/21/58	At pump	Pump test and power records	0	0	0	0	0	0	0	5	7	4	0	0	16	
6N/1E-7J1	William F. Silva	Irrigation 5/12/58 10/16/58	At pump	Pump test, power records, and operation record	0	0	0	0	8	14	21	19	20	6	0	0	88	
6N/1E-11C1	O. F. Timmons and Son	Irrigation and stockwatering 7/9/58 - 8/27/58	At pump	**Estimated discharge and hours of operation**	0	0	0	0	0	0	6^{e}	5^{e}	0	0	0	0	11^{e}	
6N/1E-15H1	Mercer-Fraser Co.	Industrial	At pump	Estimated pump capacity and operation record	- - -	- - -	- - -	- - -	- - -	- - -	**	- - -	- - -	- - -	- - -	- - -	70^{e}	
6N/1E-24Q1	A. W. Christie	Irrigation 7/4/58 - 9/6/58	At area of use	Sprinkler rating and operation record	0	0	0	0	0	0	39	39	8	0	0	0	86	
6N/1E-24Q2	A. W. Christie	Irrigation 7/4/58 - 9/6/58	At area of use	Sprinkler rating and operation record	0	0	0	0	0	0	33	33	7	0	0	0	73	
6N/2E-31H1	Melvin P. Roberts, Jr.	Irrigation 5/13/58 - 10/14/58	At pump	Pump test, power records and operation record	0	0	0	0	7	9	15	24	9	8	0	0	72	
6N/1W-1B1	James H. Werner	Irrigation 5/20/58 August 1958	At pump	Pump test and operation record	0	0	0	0	0•	0	5	1	0	0	0	0	6	
7N/1E-17E1	Alfred W. Thoma	Irrigation and domestic	At pump	Estimated pump capacity and power records	0	0	0	0	0	4•	2^{e}	1•	0	0	0	0	7•	
7N/1E-17R1	T. George Everett	Irrigation and stockwatering 5/15/58 - 10/14/58	At pump	Pump test, power records and operation record	0	0	0	0	2	4	3	3	2	1	0	0	15	
7N/1E-17R2	Albert R. and John R. Forrest	Irrigation and stockwatering 6/21/58 - 9/2/58	At pump	Pump test and operation record	0	0	0	0	0	6	11	17	2	0	0	0	36	
7N/1E-18R1	Henrietta Hartman	Irrigation and stockwatering	At pump	Pump test and power records	0	0	0	0	2	3	6	2	1	0	0	0	14	

• See remarks
e Estimated quantity

MONTHLY RECORDS OF SURFACE WATER DIVERSIONS
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT
1958

Diversion location	Diversion name or owner	Use	Point of measurement or estimate	Method of observation and calculation	Amount diverted, in acre-feet													Remarks
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	
H B & M					Blue Lake Subunit (Continued)													
7N/1E-18H1	Edward C. Bott	Irrigation	At pump	Pump test and power records	0	0	0	0	3	6	16	20	6	0	0	0	51	
7N/1E-18K1	Oscar N. Kunts	Irrigation 7/11/58 - 9/6/58	At pump	Pump test and operation record	0	0	0	0	0	0	11	12	1	0	0	0	24	
7N/1E,27A1	Jess A. Luster	Irrigation and stockwatering 6/4/58 - 9/15/58	At pump	Pump test and operation record	0	0	0	0	0	8	7	10	5	0	0	0	30	
7N/1E-27H1	Jess A. Luster	Irrigation and stockwatering 6/4/58 - 9/15/58	At pump	Pump test and operation record	0	0	0	0	0	4	3	4	2	0	0	0	13	
7N/1E-28D1	Julius M. Hooveo	Irrigation and stockwatering 5/15/58 - 9/7/58	At pump	Estimated discharge and power records	0	0	0	0	1^{e}	3^{e}	4^{e}	3^{e}	1^{e}	0	0	0	12*	
7N/1E-29B1	Humboldt County Division of Aviation	Domestic and stockwatering	At storage tank	Daily change in storage	2	1	1	1	1	1	1	2	2	2	2	2	18	
7N/1E-30Q1	Henry L. Sorensen	Irrigation 6/10/58 - 9/6/58	At pump	Pump test and operation record	0	0	0	0	0	3	7	4	1	0	0	0	15	
7N/1W-25J1	Albert C. Hertman	Irrigation 6/1/58 - 8/31/58	At pump	Estimated discharge and hours of operation	0	0	0	0	- -	- -	••	- -	- -	0	0	0	10^{e}	
					Butler Valley Subunit													
5N/2E-16G1	Sweasey Dam	Export	At Hubbard Lane	City of Eureka measurement	266	278	261	314	372	371	411	415	345	316	256	261	3,866	
5N/wE-36P1	Lois Speier	Irrigation and stockwatering 6/16/58 - 9/6/58	At pump	Estimated discharge and hours of operation	0	0	0	0	0	20^{e}	30^{e}	30^{e}	10^{e}	0	0	0	90*	
5N/2E-36Q1	Lois Speier	Irrigation and stockwatering 6/16/58 - 9/6/58	At pump	Estimated discharge and hours of operation	0	0	0	0	0	20^{e}	30^{e}	30^{e}	10^{e}	0	0	0	9	
					Little River Subunit													
7N/1E-8C1	John Christie	Irrigation and stockwatering	At pump	Pump test and power records	0		0	0	4	28	51	43	28	18	0	0	172	
7N/1E-8E1	Dr. Sanford M. Moosa	Irrigation and stockwatering	At pump	Estimated discharge and hours of operation	0	0	0	0	0	-	•• - -	2^{e}	1^{e}	0	0	0	4^{e}	
7N/1E-8F1	Dr. Sanford M. Moose	Irrigation 7/6/58 - 9/6/58	At pump	Pump test and operation record	0	0	0	0	0	0	41	41	10	0	0	0	92	
7N/1E-8G1	John E. Balke	Irrigation and stockwatering 6/30/58 - 8/29/58	At pump	Pump test and operation record	0	0	0	0	0	0	7	5	0	0	0	0	12	
7N/1E-8G2	John E. Balke	Irrigation 7/16/58 - 7/21/58	At pump	Pump test and operation record	0	0	0	0	0	0	3	0	0	0	0	0	3	
7N/1E-8R1	Uno Nylander	Irrigation	At pump	Pump test and power records	0	0	0	2	7	7	8	8	8	2	1	2	45	

* See remarks
e Estimated quantity
- - •• - Diversion estimated for period indicated

TABLE 7 (Continued)

MONTHLY RECORDS OF SURFACE WATER DIVERSIONS
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT
1958

Diversion location	Diversion name or owner	Use	Point of measurement or estimate	Method of observation and calculation	Amount diverted, in acre-feet													Remarks
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	
B B & M					North Fork Subunit													
6N/2E-28L1	Simpson Redwood Co.	Industrial	At pump	Pump test and operation record	1	1	1	1	1	1	5	8	7	8	3	1	38	
					Orick Subunit													
11N/1E-22K1	Robert S. Davison	Irrigation 7/8/58 - 9/15/58 and stockwatering	At pump	Pump test and power records	0	0	0	0	0	0	12	10	2	0	0	0	24	
11N/1E-27Q1	Arcata Redwood Co.	Irrigation and stockwatering 5/14/58 - 10/12/58	At pump	Pump test and operation record	0	0	0	0	5	10	14	12	5	5	0	0	51	
					Ruth Subunit													
2S/7E-2F1	Aubert R. and Mary Lou Jeans	Irrigation 6/1/58 - 11/1/58	At area of use	Pump test and operation record	0	0	0	0	0	6	6	6	6	6	0	0	30*	Reported diversion total does not in clude undetermined amount for two domestic connections.
		Power and domestic	At power plant	Nozzle rating and operation record	21	18	21	20	21	20	21	21	20	21	20	21	245	
			Total	diverted	21	18	21	20	21	26	27	27	26	27	20	21	275*	
2S/7E-3A1	Anna Terral	Irrigation 6/1/58 - 11/1/58	At area of use	Pump test and operation record	0	0	0	0	0	8	8	8	8	8	0	0	40*	Reported diversion total does not include undetermined amount for two domestic connections.
		Power and domestic	At power plant	Nozzle rating and operation record	25	23	25	25	25	8	8	8	8	8	8	9	180	
			Total	diverted	25	23	25	25	25	16	16	16	16	16	8	9	220*	
2S/7E-4C1	Earl P. Dillon	Irrigation 4/15/58 - 10/31/58	At pump	Pump test and operation record	0	0	0	1	0	1	2	2	2	2	0	0	10	
2S/7E-23J1	Roy Gallagher and Glen Rector	Irrigation 5/1/58 - 9/9/58, domestic and stockwatering	100 feet below intake	Depth-flow relationship and staff gage	11^{e}	10^{e}	11^{e}	11^{e}	11^{e}	9	6	6	9*	12*	12*	15*	123^{e}	Amount diverted 9/12/58 - 10/12/58 used to fill 5 acre-foot reservoir. Amount diverted 10/12/58 - 12/31/58 includes undetermined amount of spill below point of measurement.
					Snow Camp Subunit													
					(No diversions measured)													

* See remarks
e Estimated quantity
--**-- Diversion estimated for period indicated

known to have been zero, it is so indicated. The data, however, were sometimes not sufficiently detailed to justify a breakdown into monthly quantities. These cases are indicated by --NR--. Dashes are used to indicate that a quantity was not determined. The measurements are designated as estimates when only incomplete or somewhat uncertain data could be obtained.

Index to Surface Water Diversions

An alphabetical index to diversion names and owners is provided in Table 8 at the end of this chapter. For each diversion, this table indicates the diversion location, subunit, and county. For convenience in finding data regarding individual diversions, the sheet number of Plate 2 and the pages on which pertinent data appear are also provided.

Imports and Exports

There were no imports of surface water into the Mad River-Redwood Creek Hydrographic Unit in 1958. There were three diversions from which water was exported, all into the Eel River Hydrographic Unit. The largest of these is the Sweasey Dam diversion located as 5N/2E-16G1, on the Mad River. All of the 3,866 acre-foot output from this diversion was exported for use at Eureka. The other two diversions, also from Mad River, were for irrigation of areas lying partly on each side of the hydrographic unit line. These two diversions were not measured. One, 6N/1E-7L1, irrigated 38 acres in the Mad River-Redwood Creek Hydrographic Unit and 14 acres in the Eel River Hydrographic Unit in 1958. The other, 6N/1E-7J1, irrigated 4 acres and 16 acres in the two units, respectively.

Consumptive Use

In the Mad River-Redwood Creek Hydrographic Unit, virtually all of the consumptive use of applied water is in connection with irrigated agriculture, lumber mill operations, and urban uses. Consumptive use of water is defined as any type of use through which water is rendered unavailable for reuse. Processes in which water is consumptively used are transpiration and building of plant tissue by vegetation; evaporation from water surface, foliage and adjacent soil; and consumption and evaporation by urban and other nonvegetative types of land use. Certain uses of water, such as for hydroelectric power generation, fish culture, and mining operations, are essentially nonconsumptive.

The total of applied water, from both surface and ground sources, consumptively used in the Mad River-Redwood Creek Hydrographic Unit is estimated to have been about 4,500 to 5,000 acre-feet in 1958. The amount consumed by irrigation use was about 2,700 acre-feet, the remainder being consumed about equally by municipal-domestic use and by lumber mill operations. Consumptive use for other purposes was negligible.

TABLE 8

INDEX TO SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion name and/or owner	Diversion location	Subunit and county	References	
			Plate 2 sheet no.	Text and appendixes page nos
	H B & M			
Addison Dam Roddiscraft, Inc.	4N/3E-6H1	Butler Valley Humboldt	7	34, C-11
Arcata Redwood Company Hill Davis	11N/1E-27Q1	Orick Humboldt	1	35, 40, 57, C-13
Balke, John E.	7N/1E-8G1 7N/1E-8G2	Little River Little River Humboldt	4 4	34, 39, 56 34, 39, 57
Blue Lake, City of	6N/2E-21C1	North Fork Humboldt	5	22, 35, C-11
Bott, Edward C.	7N/1E-18H1	Blue Lake Humboldt	4	32, 39, 55, C-12
Bugenig, Joe W.	6N/1E-6Q1	Blue Lake Humboldt	5	31, 38, 55
California State Department of Fish and Game Humboldt County, lessee	11N/1E-23A1	Orick Humboldt	1	35, C-10
California State Department of Natural Resources; Division of Forestry	8N/1W-14K1	Big Lagoon Humboldt	3	30, C-11
California State Division of Highways	See Preston, Harold			
Christie, A. W.	6N/1E-24G1 6N/1E-24G2	Blue Lake Blue Lake Humboldt	5 5	31, 38, 55 32, 38, 55
Christie, John	7N/1E-8C1	Little River Humboldt	4	34, 39, 56
Cottage Gardens Company, Inc.	See Nylander, Uno			
Daily, John D.	7N/1E-31C1	Blue Lake Humboldt	4	33, 56, C-11
Davis, Hill	See Arcata Redwood Company			
Davison, Robert S.	11N/1E-22K1	Orick Humboldt	1	35, 40, 57
Dillon, Earl P.	2S/7E-4C1	Ruth Trinity	10	36, 40, 57
Dudal, Hans	7N/1E-30J1	Blue Lake Humboldt	4	33, 56
Edeline, Elgin O.	8N/1E-31D1	Big Lagoon Humboldt	3	30, C-11

TABLE 8 (Continued)

INDEX TO SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion name and/or owner	Diversion location	Subunit and county	References	
			Plate 2 sheet no.	Text and appendixes page nos.
	H B & M			
Essex Mill Pond G. F. Timmons and Son	6N/1E-14B1	Blue Lake Humboldt	5	31
Eureka, City of	See Sweasey Dam			
Everett, T. George	7N/1E-17R1	Blue Lake Humboldt	4	32, 38, 55
Forest, Albert R. and John R.	7N/1E-17R2	Blue Lake Humboldt	4	32, 38, 55, C-12
Fulton, Roy	3N/3E-3F1	Butler Valley Humboldt	8	33, 56
Gallagher, Roy and Rector, Glen	2S/7E-23J1	Ruth Trinity	10	36, 40, 57
Geijsbeek, Lester J., et al.	See Six Rivers Pine Sales			
Georgia Pacific Corporation; Hammond-California Redwood Division	8N/1E-33K1	Little River	3	35
	9N/1E-19G1	Big Lagoon Humboldt	2	30, C-11
Hartman, Albert C.	7N/1W-25J1	Blue Lake Humboldt	4	33, 39, 56
Hartman, Henrietta	7N/1E-18B1	Blue Lake Humboldt	4	32, 38, 55, 56, C-11
Hauser, Carroll	7N/1E-34A1	Blue Lake Humboldt	4	33, 56
Hooven, Julius M.	7N/1E-28D1	Blue Lake Humboldt	4	33, 39, 56
Horton, Marion J.	6N/1E-7R1	Blue Lake Humboldt	5	31, 55
Humboldt County	See California State Department of Fish and Game			
Humboldt County Division of Aviation	7N/1E-29B1	Blue Lake Humboldt	4	33, 39
Jeans, Aubert N. and Mary Lou	2S/7E-2F1	Ruth Trinity	10	36, 40, 57
Johnson, Earl C.	6N/1E-9R1	Blue Lake Humboldt	5	31, 55
Kuntz, Oscar N.	7N/1E-18K1	Blue Lake Humboldt	4	32, 39, 55
Luster, Jess A.	7N/1E-27A1	Blue Lake	4	32, 39, 56, C-12
	7N/1E-27H1	Blue Lake	4	33, 39, 56, C-12
	7N/1E-27R1	Blue Lake Humboldt	4	33, 56, C-12

TABLE 8 (Continued)

INDEX TO SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion name and/or owner	Diversion location	Subunit and county	References	
			Plate 2 sheet no.	Text and appendixes page nos
	H B & M			
Martin, Carl	7N/1E-32F1	Blue Lake Humboldt	4	33, 56, C-11
McAllister, George	9N/1W-26L1	Big Lagoon Humboldt	2	30, 38, 55
McNeil, William	10N/1E-29F1 10N/1E-29L1	Big Lagoon Big Lagoon Humboldt	1 1	30, 55 30, 38, 55
Mercer - Fraser Company	6N/1E-15H1 6N/1E-15H2	Blue Lake Blue Lake Humboldt	5 5	31, 38 31
Moose, Dr. Sanford M.	7N/1E-8E1 7N/1E-8F1	Little River Little River Humboldt	4 4	34, 39, 56 34, 39, 56
Nylander, Uno	7N/1E-8R1	Little River Humboldt	4	35, 39, 56, 57, C-11
Pifferini, Mary, et al.	6N/1E-7L1	Blue Lake Humboldt	5	31, 41, 55, C-10
Preston, Harold	7N/3E-31C1	North Fork Humboldt	4	35, C-12
Rector, Glen	See Gallagher, Roy			
Roberts, Melvin P., Jr.	6N/2E-31H1	Blue Lake Humboldt	5	32, 38, 55, C-13
Roddiscraft, Inc.	See Addison Dam			
Santos, Manuel	6N/1E-8L1	Blue Lake Humboldt	5	27, 31, 55
Silva, William F.	6N/1E-7J1	Blue Lake Humboldt	5	31, 38, 41, 55, C-10
Simpson Redwood Company	6N/2E-28L1 6N/2E-28M1	North Fork North Fork Humboldt	5 5	35, 40 35
Six Rivers Pine Sales Lester J. Geijsbeek, et al.	3S/8E-6A1	Ruth Trinity	10	36
Sorensen, Henry L.	7N/1E-30Q1	Blue Lake Humboldt	4	33, 39, 56
Speier, Lois	5N/2E-36P1 5N/2E-36Q1	Butler Valley Butler Valley Humboldt	6 6	34, 39, 56 34, 39, 56
Sweasey Dam City of Eureka	5N/2E-16G1	Butler Valley Humboldt	6	11, 22, 23, 34, 39, 41, C-10

TABLE 8 (Continued)

INDEX TO SURFACE WATER DIVERSIONS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

Diversion name and/or owner	Diversion location	Subunit and county	References	
			Plate 2 sheet no.	Text and appendixes page nos.
	H B & M			
Terral, Anna	2S/7E-3A1	Ruth Trinity	10	36, 40, 57
Thoma, Alfred W.	7N/1E-17E1	Blue Lake Humboldt	4	32, 38, 55, C-11
Timmons, G. F. and Son	6N/1E-11A1	Blue Lake	5	31, 55
	6N/1E-11C1	Blue Lake Humboldt	5	31, 38, 55
	See also Essex Mill Pond			
Townsend, Rowena J.	8N/1E-32M1	Little River Humboldt	3	35, C-10
Trinidad, City of	8N/1W-23H1	Big Lagoon Humboldt	3	22, 30, 38, C-13
United States Plywood Corporation	7N/3E-5L1	Beaver	4	30
	7N/3E-5L2	Beaver	4	30
	7N/3E-6K1	Beaver Humboldt	4	30, 38
Ward, David S.	See Nylander, Uno			
Werner, James H.	6N/1W-1B1	Blue Lake Humboldt	5	32, 38, 55
Wiggins, Dr. C. G., et ux.	4N/3E-21C1	Butler Valley Humboldt	7	34, 56

CHAPTER III. LAND USE

This chapter presents a discussion of the procedures and the tabulated results of a survey of land use in the Mad River-Redwood Creek Hydrographic Unit in 1958. These results, as well as those of the water use data presented in Chapter II, are essential to the determination of future water requirements of the unit. A brief account of historical land use in the unit is presented to supplement the survey data.

Historical Land Use

Development within the Mad River-Redwood Creek Hydrographic Unit began, as mentioned in Chapter I, as a result of exploration of the coast in search of routes to the Trinity gold fields. The 1850's saw the first urban developments, beginning at Trinidad, and the introduction of agriculture, mainly on the smoother open lands near the coast. The use of lands specifically for recreational purposes was not significant in the unit until many years later.

Urban land use in the unit remained small until the boom which followed World War II. Trinidad and Blue Lake, the oldest and only incorporated towns, have in recent years been surpassed in area and population by the scattered unincorporated community of McKinleyville. Several smaller communities are located in the coastal area of the unit. These communities, including Crannell, Fieldbrook, Korbel, Mapel Creek, and Orick, owe their existence largely to the lumber industry. In fact, nearly all the urban centers in the unit include this type of industrial land use, as well as residential and commercial types.

In relation to water use, and in acreage of developed land, agricultural land use is the major type in the Mad River-Redwood Creek Hydrographic

Unit. (Lands which are in an essentially undeveloped condition and receive no applied water, even though they supply valuable timber and forage, are mapped as native vegetation for the purpose of this report.) Historically, agriculture has been a significant activity since the 1850's. The remoteness of this region from sources of supply and markets has largely determined the nature of its agriculture. Meeting the local demand for food -- principally meat, dairy products, potatoes, etc. -- as well as feed for livestock, set the pattern of agriculture for some 70 years. After 1900 dairying and beef raising were well established as the primary farm activities.

Improvement of transportation in recent decades has made possible a wider variety of farm products. This trend began after completion of the rail line to Eureka in 1914, but an even greater change came after modern roads made trucking feasible. Most significant of these developments was the rapid expansion, starting about 1940, of the previously small nursery and truck industry. The following tabulation of sales values of these crops in Humboldt County illustrates these changes during the early 1940's.

	1940	1945
Horticultural specialties	$76,000	$341,000
Vegetables	23,000	374,000

Though these are Humboldt County totals, the sharp rise is apparent and the new pattern has continued. In recent years, the value of horticultural production has been greater than that of any other farm activity except dairying. In acreage, however, pasture still dominates the agricultural land use, comprising more than 90 percent of the irrigated lands and 70 percent of the dry-farmed lands in 1958.

Irrigation, the largest water using activity, has likewise been very largely a development of the last two decades. As of 1939 there were only nine irrigated farms and 179 acres irrigated in the Mad River drainage area. The 1958 survey, however, showed that over 3,300 acres in the unit were irrigated.

Recreational activities, mainly hunting and fishing, have been pursued in the unit since its settlement. Until recent years, however, there was only a small amount of land use devoted to recreation. Even in the 1958 survey, only about 300 acres were found to be actually so developed. The unit has, nevertheless, an abundance of lands naturally suited to recreational uses. The redwood forests and diverse types of coastal and mountain terrain in the unit are some of the State's finest scenery. Over 10,000 acres of these lands have been set aside as public parks.

Present Land Use

A detailed description of the survey of land uses conducted in 1958 is described in the following paragraphs. The land uses mapped in this survey fall into four major categories: irrigated lands, dry-farmed lands, urban lands, and recreational lands; and one minor category: naturally high water table lands, such as meadowlands and marshes. Lands not falling into any of these five categories were mapped as "native vegetation." The location and extent of the lands falling into each of these categories are delineated on Sheets 1 through 11 of Plate 2. The acreages of the various land uses within each subunit are presented in Table 9. The values represent gross acreages, and include those nonwater-service areas such as roads, ditches, farm building and storage areas, and miscellaneous rights-of-way, which were too small to be separated from the mapped areas in which they were located.

TABLE 9

LAND USE IN

MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT, 1958

(In acres)

Subunit and County	Irrigated lands	Naturally high water table lands		Dry-farmed lands	Urban lands	Recreational lands			
		Meadowlands	Marsh			Residential	Commercial	Camp sites	Parks
Beaver Subunit									
Humboldt County	0	0	0	40	30	20	0	0	0
Big Lagoon Subunit									
Humboldt County	110	100	140	220	350	60	10	10	1,430
Blue Lake Subunit									
Humboldt County	2,460	150	20	2,550	2,590	0	10	0	40
Butler Valley Subunit									
Humboldt County	120	30	0	260	60	10	0	0	0
Trinity County	0	0	0	0	0	0	0	0	0
Little River Subunit									
Humboldt County	270	70	0	160	350	10	0	0	140
North Fork Subunit									
Humboldt County	0	10	0	40	170	10	0	0	20
Orick Subunit									
Humboldt County	330	90	0	630	270	0	10	10	8,940
Ruth Subunit									
Trinity County	40	0	0	20	40	110	20	10	0
Snow Camp Subunit									
Humboldt County	0	50	0	90	0	10	0	0	0
County Totals:									
Humboldt County	3,290	500	160	3,990	3,820	120	30	20	10,570
Trinity County	40	0	0	20	40	110	20	10	0
Hydrographic Unit Total	3,330	500	160	4,010	3,860	230	50	30	10,570

Methods and Procedures

The location of surface water diversions and the land use survey were accomplished by relating field observations to aerial photographs having a scale of about 1:20,000. The use of stereoscopes was of great assistance in this work. As each surface water diversion was located, it was plotted on the aerial photograph. Following this, the use and extent of each parcel of land were determined, and delineations and annotations made accordingly on the photographs. The hydrographic unit was traversed by automobile as completely as roads and terrain permitted. Where necessary because of poor accessibility, inspections were made on foot.

A system of annotations designed to indicate both the broad types of land use mentioned in the previous section, and subclassifications denoting specific uses, was employed. Agricultural lands were surveyed to determine whether or not parcels were irrigated and what crops were raised. This information was then annotated on the photographs. The crops observed were identified by general crop groups, as well as the specific crops present.

A list of the general groups of crops and the specific crops comprising each group are listed below, with the crops found in the unit in 1958 underlined:

G - Grain and hay crops

Wheat, barley, oats, miscellaneous

F - Field crops

Cotton, safflower, flax, hops, sugar beets, corn (field or sweet), Grain sorghums, castor beans, miscellaneous

P - Pasture

Alfalfa, clover, mixed, native, induced high water table native, sudan

T - Truck

Artichokes, asparagus, beans (green or dry), cole crops, carrots, celery, lettuce, melons, squash, cucumbers, onions, garlick, peas, potatoes, sweet potatoes, spinach, tomatoes, flowers, nursery, bushberries, strawberries, peppers, miscellaneous

D - Deciduous fruits and nuts

Apples, apricots, cherries, peaches, nectarines, pears, plums, prunes, figs, almonds, walnuts, miscellaneous

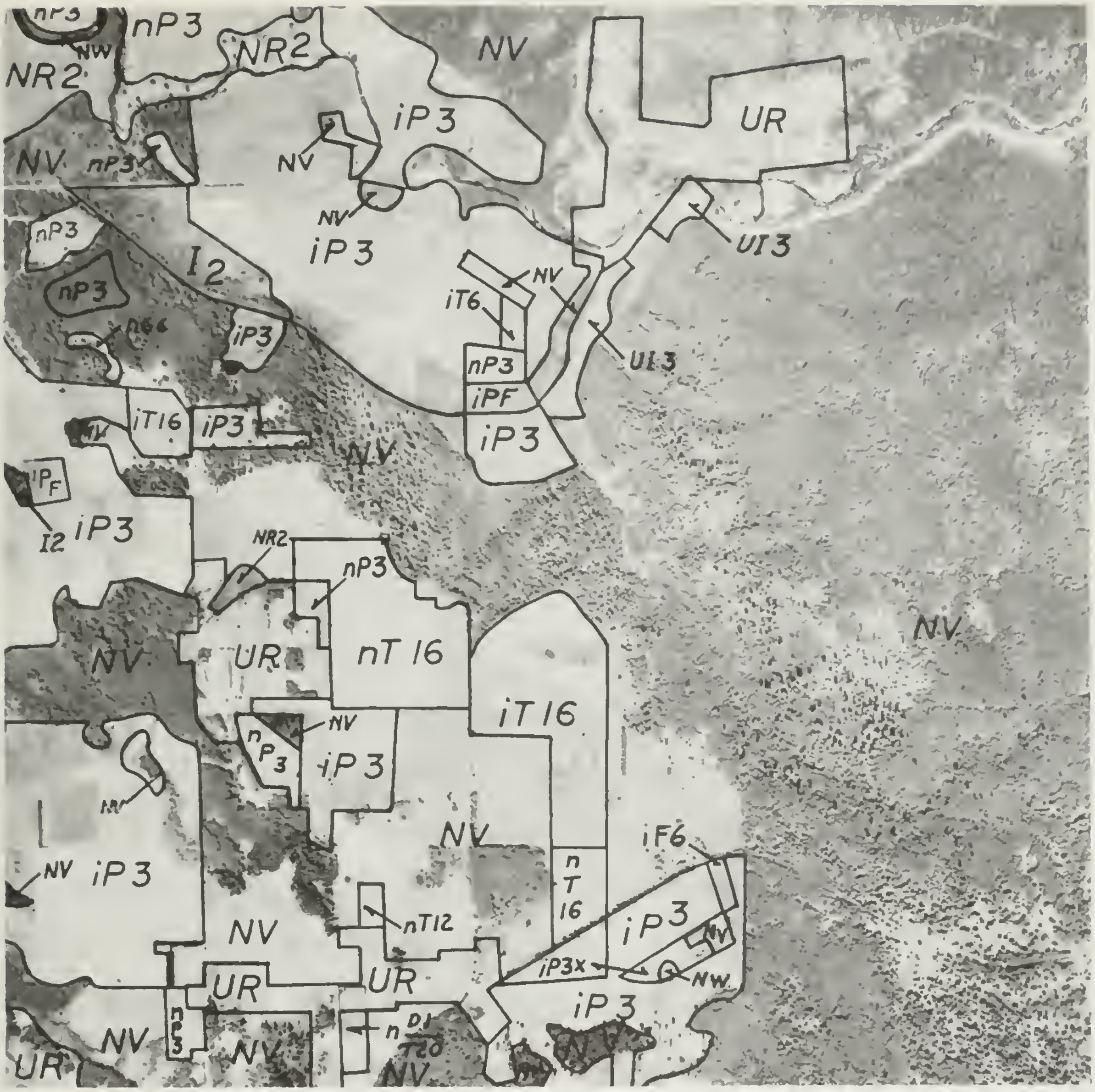
An example of an aerial photograph with land use data delineated on it is shown on Page 53.

After completion of the field mapping, the data delineated on the photographs were transferred to copies of U. S. Geological Survey quadrangle maps reproduced at a scale of 1:24,000. This procedure was necessary to bring the delineated areas to a common scale for accurate determination of acreages, since the scale of the aerial photographs utilized varied widely. A series of these maps showing the location of all diversions, and the fields associated with each irrigation diversion, was colored according to the land use categories and was reveiwed by local parties concerned. These maps were then used in the preparation of Plate 2.

Another series of these maps was used in computing the acreages of the land uses. Each delineated area on these maps was manually cut out and was carefully weighed on an analytical balance. These weights were converted to acreages, using ratios determined for the individual maps. This method has proven to be a very expedient and accurate means of area determination where a large number of small parcels are involved.

Irrigated Lands

Irrigated lands, as designated in this report, include all agricultural lands which receive water artificially. As these lands were noted



Example of Land Use Delineated on Aerial Photograph

Symbols used on this photograph:

Irrigated Lands

iP3 - mixed pasture
iP3x - mixed pasture, partial irrigation
iPF - pasture, fallow
iT6 - carrots
iT16 - flowers and nursery
iF6 - corn

Dry-farmed Lands

nP3 - mixed pasture
nG6 - miscellaneous or mixed hay and grain
nT12 - potatoes
nT16 - flowers and nursery
$n\frac{D1}{T20}$ - apples intercropped with strawberries
I2 - new lands being prepared for future use

Urban Lands

UI3 - storage areas
UR - residential

Miscellaneous Lands

NV - native vegetation
NW - water (reservoirs, etc.)
NR2 - meadowland

in the field survey they were identified as such by the symbol "i" as on the sample photograph. The fields of various crops and of "idle" land were identified with specific water sources and the acreages determined accordingly. Idle irrigated lands are defined as lands which were not irrigated in 1958, but had irrigation facilities and had been irrigated within the preceding three years. Fallow irrigated lands are those cultivated lands which have facilities for irrigation and may be irrigated during the year of survey, but at the actual date of survey were only tilled and not planted to a crop.

In 1958, there were 3,340 acres of irrigated lands in the Mad River-Redwood Creek Hydrographic Unit. Of this total, 87 percent were in pasture-type crops, seven percent were in truck crops, mainly nursery, one percent miscellaneous, and the remaining five percent were idle or fallow.

Acreages of irrigated lands within the various subunits are reported in Table 10 by surface diversion. For each irrigation diversion, the acreage of each crop group and, where applicable, the acreage previously irrigated but not cropped in 1958, are tabulated. Any of these lands which received a supplementary supply from ground water are indicated. The acreages to which ground water only was applied are also listed.

On Plate 2, irrigated lands are grouped in just three categories: (1) those which were cropped and to which water was actually applied during the year of survey; (2) those lands which received only a partial supply of water in 1958; and (3) those which were idle or fallow. The use of ground water is indicated by cross-hatching.

TABLE 10

IRRIGATED LANDS IN
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

1958 (in acres)

Diversion or other source serving irrigated lands		Mixed pasture	Field crops	Truck crops		Deciduous orchard	Total lands irrigated	Irrigated[a] idle or fallow	Total
sion location	Diversion owner			Nursery	Other				
H B & M									
			Beaver Subunit						
			(No irrigated lands)						
			Big Lagoon Subunit						
1W-26L1	George McAlliater	9					9		9
/1E-29F1	William McNeil	56[b]					56[b]		56[b]
/1E-29L1	William McNeil	24[b]					24[b]		24[b]
Total Surface Water Supply		89[c]	0	0	0	0	89[c]	0	89[c]
Total Ground Water Supply		22	0	2	0	0	24	0	24
al Big Lagoon Subunit umboldt County		111	0	2	0	0	113	0	113
			Blue Lake Subunit						
1E-6Q1	Joe W. Bugenig	27					27		27
1E-7J1	William Silva	95					95		95
1E-7L1	Mary Pifferini, et al.	38					38	2	40
1E-7R1	Marion J. Horton	4					4		4
1E-8L1	Manuel Santos	34					34		34
1E-9R1	Earl C. Johnson	5					5		5
1E-11A1	G. F. Timmons and Son							45	45
1E-11C1	G. F. Timmons and Son	36					36		36
1E-24G1	A. W. Christie	85					85		85
1E-24G2	A. W. Christie	109					109		109
2E-31H1	Melvin P. Roberts, Jr.	37	6				43		43
1W-1B1	James H. Werner			5			5		5
1E-17E1	Alfred W. Thoma	27					27		27
1E-17R1	T. George Everett	35[d]	3				38[d]		38[d]
1E-17R2	Albert R. and John R. Forrest	43					43		43
1E-18B1	Henrietta Hartman	102		10			112	4	116
1E-18H1	Edward C. Bott	78					78		78
1E-18K1	Oscar N. Kuntz	55					55		55

lettered footnotes, see last page of table.

TABLE 10 (Continued)

IRRIGATED LANDS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

1958 (in acres)

Diversion or other source serving irrigated lands		Mixed pasture	Field crops	Truck crops		Deciduous orchard	Total lands irrigated	Irrigated[a] idle or fallow	Total
Diversion location	Diversion owner			Nursery	Other				
H B & M				Blue Lake Subunit (continued)					
7N/1E-27A1	Jess A. Luster	12					12		12
7N/1E-27H1	Jess A. Luster	25					25		25
7N/1E-27R1	Jess A. Luster	14					14		14
7N/1E-28D1	Julius M. Hooven			16			16	68	84
7N/1E-30J1	Hans Dudal	16					16		16
7N/1E-30Q1	Henry L. Sorenson	30					30		30
7N/1E-31C1	John D. Daily	7[e]					7[e]		7[e]
7N/1E-32F1	Carl Martin	4[f]					4[f]		4[f]
7N/1E-34A1	Carroll Hauser	21					21		21
7N/1W-25J1	Albert C. Hartman			36			36	8	44
7N/1E-8R1 (Little River Subunit)	Uno Nylander Cottage Gardens Company, Inc., lessee			36			36		36
Total Surface Water Supply		939	9	103	0	0	1,051	127	1,178
Total Ground Water Supply		1,162	9	53	43	0	1,267	15	1,282
Total Blue Lake Subunit Humboldt County		2,101	18	156	43	0	2,318	142	2,460
				Butler Valley Subunit					
3N/3E-3F1	Roy Fulton	3					3		3
4N/3E-21C1	Dr. C. G. Wiggins, et ux.	10					10		10
5N/2E-36P1 5N/2E-36Q1	Lois Speier	95				14	109		109
Total Surface Water Supply		108	0	0	0	14	122	0	122
Total Ground Water Supply		0	0	0	1	0	1	0	1
Total Butler Valley Subunit Humboldt County		108	0	0	1	14	123	0	123
				Little River Subunit					
7N/1E-18B1 (Blue Lake Subunit)	Henrietta Hartman	5		13			18		18
7N/1E-8C1	John Christie	80					80		80
7N/1E-8E1	Dr. Sanford M. Moose	15					15		15
7N/1E-8F1	Dr. Sanford M. Moose	99					99		99
7N/1E-8G1	John E. Balke	12			4		16	4	20

For lettered footnotes, see last page of table.

TABLE 10 (Continued)

IRRIGATED LANDS IN
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

1958 (in acres)

Diversion or other source serving irrigated lands		Mixed pasture	Field crops	Truck crops		Deciduous orchard	Total lands irrigated	Irrigated[a] idle or fallow	Total
ersion location	Diversion owner			Nursery	Other				
H B & M				Little River Subunit (continued)					
/1E-8G2	John E. Balke	8					8		8
/1E-8R1	Uno Nylander Cottage Gardens Company, Inc., lessee			18			18		18
Total Surface Water Supply		219	0	31	4	0	254	4	258
Total Ground Water Supply		14	0	0	0	0	14	0	14
tal Little River Subunit Humboldt County		233	0	31	4	0	268	4	272
				North Fork Subunit					
				(No irrigated lands)					
				Orick Subunit					
N/1E-22K1	Robert S. Davison	68					68		68
N/1E-27Q1	Arcata Redwood Company Hill Davis	29					29		29
Total Surface Water Supply		97	0	0	0	0	97	0	97
Total Ground Water Supply		236	0	0	0	0	236	0	236
tal Orick Subunit Humboldt County		333	0	0	0	0	333	0	333
				Ruth Subunit					
/7E-2F1	Aubert N. and Mary Lou Jeans	4					4		4
/7E-3A1	Anna Terral	4					4		4
/7E-4C1	Earl P. Dillon	7				2	9	14	23
/7E-23J1	Roy Gallagher and Glen Rector	9					9		9
Total Surface Water Supply		24	0	0	0	2	26	14	40
Total Ground Water Supply		0	0	0	0	3	3	0	3
tal Ruth Subunit Trinity County		24	0	0	0	5	29	14	43
				Snow Camp Subunit					
				(No irrigated lands)					

r lettered footnotes, see last page of table.

TABLE 10 (Continued)

IRRIGATED LANDS IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

1958 (in acres)

Diversion or other source serving irrigated lands		Mixed pasture	Field crops	Truck crops		Deciduous orchard	Total lands irrigated	Irrigated[a] idle or fallow	Total
Diversion location	Diversion owner			Nursery	Other				
				SUMMARY					
Lands Irrigated by Ground Water Humboldt County		1,434	9	55	44	0	1,542	15	1,557
Trinity County		0	0	0	0	3	3	0	3
Lands Irrigated by Surface Water Humboldt County		1,452[c]	9	134	4	14	1,613[c]	131	1,744[a]
Trinity County		24	0	0	0	2	26	14	40
Total Mad River-Redwood Creek Hydrographic Unit		2,910	18	189	48	19	3,184	160	3,344

Footnotes:

(a) Lands ordinarily irrigated, but idle or fallow in 1958
(b) Received supplemental supply from ground water
(c) 80 acres received supplemental supply from ground water
(d) 15 acres received partial irrigation
(e) 5 acres received partial irrigation
(f) Acreage reported is alfalfa hay and pasture

Rhododendron
culture near
Dow's Prairie

AGRICULTURAL LAND USE

Irrigated pasture
Little River
Subunit

Naturally High Water Table Lands

In addition to the lands which receive applied water as described above, there are lands supporting vegetation which utilizes water from a naturally high water table, such as mountain meadows or certain lands adjacent to lakes and streams. These lands are divided into two groups:

> "meadowlands" where the water table is normally below the surface; and
>
> "marsh" which is under water much of the year, and supports a growth of tules, cattails, bullrushes, and similar vegetation.

These two groups are designated "naturally irrigated meadowlands" and "marsh or swamp" on Plate 2.

Dry-farmed Lands

Dry-farmed lands are those lands normally in crop but which do not receive applied water. This category includes all lands so farmed, whether or not a crop is produced in the year of survey. Dry-farmed lands are called "idle" if entirely uncultivated in the year of survey, and "fallow" if tilled but without a crop. Lands which had been idle for more than three years and appeared to have reverted to native vegetation were so mapped.

It should be noted that the term "dry-farmed" as used herein refers to the farming practice on these lands, and not to a lack of soil moisture.

Since noncultivated rangelands are usually indistinguishable from other lands with native cover not used for grazing purposes, no attempt was made to segregate them. Both types are included in native vegetation. Water use in both cases is essentially the same, and is dependent upon precipitation.

Urban Lands

Urban lands include the total areas of cities, towns, small communities, and industrial plots which are large enough to be delineated. Also included are parks, golf courses, racetracks, and cemeteries within or near urban areas. The reported acreages of urban land use represent gross delineations, including streets and vacant lots, and are therefore not necessarily fully developed at the present time. In this survey the boundaries of urban communities were delineated to include all lands with a density of one house or more per two acres.

Recreational Lands

Recreational lands were mapped on aerial photographs in the field in four categories: (1) residential, (2) commercial, (3) camp and trailer sites, and (4) parks. Recreational "residential" lands include permanent and summer home tracts within primarily recreational areas. The estimated density of homes per acre was also indicated in the course of the survey. Recreational "commercial" lands include those containing motels, resorts, hotels, stores, restaurants, and similar commercial establishments in primarily recreational areas. Lands mapped in the "camp and trailer sites" category include those areas so used within primarily recreational areas but outside the boundaries of public parks. The entire area within the boundaries of parks was included in the "parks" category without regard to the extent of development thereon. Obviously, nearly all the mountainous, seashore, and water surface areas are suitable for some use such as hunting, fishing, hiking, picnicking, and other recreational activities of this nature. For the purpose of this land use survey, however, except for parks, consideration was given only to those lands where some fairly intensive development requiring water service was located.

Right:
Gravel plant
near
Blue Lake

Below:
Lumber Mill
at Korbel

INDUSTRIAL LAND USE

The recreational lands are tabulated by the above four categories in Table 9. However, all recreational lands are indicated alike on Plate 2. In the case of officially designated recreational lands, the areas delineated and tabulated are not necessarily fully developed. Prairie Creek Redwoods State Park is the most notable example of this.

Native Vegetation

Lands which are essentially in a native state, and not included in any of the above categories, as well as scattered residences and other isolated uses too small to be delineated, were mapped as "native vegetation." However, in addition to the lands so mapped, the total acreage reported in this native vegetation category includes lands which were mapped as water surface and farm building areas, including dairies, feed lots, etc. The total of all these lands was some 571,600 acres, or about 96 percent of the Mad River-Redwood Creek Hydrographic Unit, in 1958. Most of these lands, even in their native state, are used for commercial timber production, livestock range, and recreational activities such as fishing, hunting, hiking, and picnicking.

CHAPTER IV. LAND CLASSIFICATION

Calculations of future water requirements will be based in a large part on a classification of lands with regard to their potential for irrigated agriculture and recreational development. The results of such a land classification conducted in the Mad River-Redwood Creek Hydrographic Unit are presented in this chapter.

Lands were not classified in this survey with respect to their potential for urban development. The use of lands for urban purposes is closely related to population at any given time, and it is planned to defer designation of these lands until estimates of population and related economic studies are made in connection with determinations of future water requirements.

The former Division of Water Resources made a reconnaissance classification of lands of the State which was reported in State Water Resources Board Bulletin No. 2, "Water Utilization and Requirements of California," June 1955. In that report, the area discussed herein is contained in the "Mad River" and "Redwood Creek" units. The data on agricultural lands reported herein are in considerably greater detail than the information in Bulletin No. 2. This bulletin also includes additional data on classification of potential recreational lands not contained in Bulletin No. 2. This report is likewise more detailed as to land classification than Bulletin No. 58, "Northeastern Counties Investigation," which covers the portion of the unit within Trinity County.

Results of the land classification survey conducted in the Mad River-Redwood Creek Hydrographic Unit in 1959 are presented pictorially on Plate 3, "Classification of Lands," Sheets 1 through 11. The total acreages of each classification are enumerated by subunits in Table 12.

Methods and Procedures

The general methods and procedures used in field mapping, area determinations, and tabulation of acreages were essentially the same as those described for the land use survey in Chapter III. An example of land classification delineations on an aerial photograph is shown on Page 69.

The standards used in the classification of lands are given in detail in Table 11.

Table 11

LAND CLASSIFICATION STANDARDS

Land class: symbols	Characteristics
	Irrigable Lands
V -	These lands are level or slightly sloping and vary from smooth to hummocky or gently undulating relief. The maximum allowable slope is six percent for smooth, reasonably large-sized bodies lying in the same plane. As the relief increases and becomes more complex, lesser slopes are limiting. The soils have medium to deep effective root zones, are permeable throughout, and free of salinity, alkalinity, rock or other conditions limiting crop adaptability of the land. These lands are suitable for all climatically adapted crops.
H -	These are lands with greater slope and/or relief than those of the V class. They vary from smooth to moderately rolling or undulating relief. The maximum allowable slope is 20 percent for smooth, reasonably large-sized bodies lying in the same plane. As the relief increases and becomes more complex, lesser slopes are limiting. The soils are permeable, with medium to deep effective root zones, and are suitable for the production of all climatically adapted crops. The only limitation is that imposed by topographic conditions.
M -	These are lands with greater slope and/or relief than those of the H class. They vary from smooth to steeply rolling or undulating relief. The maximum allowable slope is 30 percent for smooth, reasonably large-sized bodies lying in the same plane. As the relief increases and becomes more complex, lesser slopes are limiting. The soils are permeable, with medium to deep effective root zones, and are suitable for the production of all climatically adapted crops. The only limitation is that imposed by topographic conditions.

Table 11 (Continued)

LAND CLASSIFICATION STANDARDS

Land class: symbols :	Characteristics
	Any variations from the foregoing, as defined, are indicated by use of one or more of the following symbols:
w -	Indicates the presence of a high water table, which in effect limits the present crop adaptability of these lands to pasture crops. Drainage and a change in irrigation practice would be required to affect the crop adaptability.
s -	Indicates the presence of an excess of soluble salts or exchangeable sodium in slight amounts, which limits the present adaptability of these lands to crops tolerant to such conditions. The presence of salts within the soil generally indicates poor drainage and a medium to high water table. Reclamation of these lands will involve drainage and the application of small amounts of amendments and some additional water over and above crop requirements in order to leach out the harmful salts.
ss -	Indicates the presence of an excess of soluble salts or exchangeable sodium in sufficient quantity to require the application of moderate amounts of amendments and some additional water over and above crop requirements in order to effect reclamation.
h -	Indicates very heavy textures, which in general make these lands best suited for production of shallow-rooted crops.
l -	Indicates fairly coarse textures and low moisture-holding capacities, which in general make these lands unsuited for the production of shallow-rooted crops because of the frequency of irrigations required to supply the water needs of such crops.
p -	Indicates shallow depth of the effective root zone, which in general limits use of these lands to shallow-rooted crops.
r -	Indicates the presence of rock on the surface or within the plow zone in sufficient quantity to prevent use of the land for cultivated crops.
	Urban Lands
UD -	The total area of cities, towns, and small communities presently used for residential, commercial, recreational, and industrial purposes. Such lands lying within areas to be inundated by projects authorized for construction are excluded.

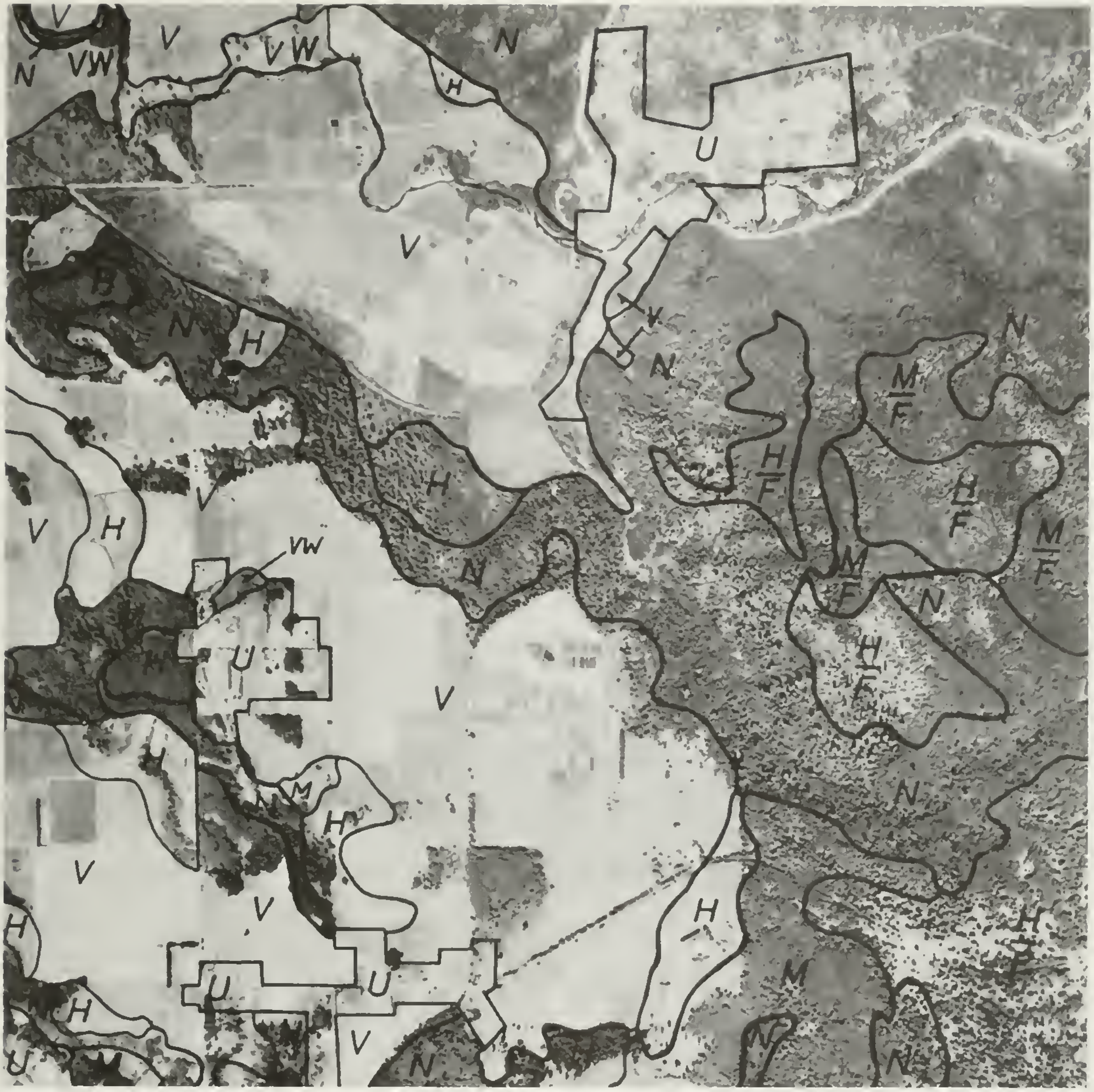
Table 11 (Continued)

LAND CLASSIFICATION STANDARDS

Land class: symbols :	Characteristics
	Recreational Lands
RR -	Existing and potential permanent and summer home tracts within a primarily recreational area. The estimated number of houses, under conditions of full development, is indicated by a number in the symbol, i.e., RR-3 is suitable for three houses per acre.
RC -	Existing and potential commercial areas which occur within a primarily recreational area and which include motels, resorts, hotels, stores, etc.
RT -	Existing and potential camp and trailer sites within a primarily recreational area.
RF -	Existing county, state, federal, and private parks, racetracks, and fairgrounds.
	Miscellaneous Lands
F -	Presently forested lands, or lands subject to forest management, which meet the requirements for irrigable land but which, because of climatic conditions and physiographic position, are better suited for timber production or some type of forest management program rather than for irrigated agriculture.
Vm -	Swamp and marshlands which are covered by water most of the time and usually support a heavy growth of phreatophytes.
N -	Includes all lands which fail to meet the requirements of the above classes.

Major Categories of Land Classes

The lands mapped are grouped into four major categories: (1) irrigable lands, (2) urban lands, (3) recreational lands, and (4) miscellaneous lands. These categories are described in detail in the following paragraphs.



Example of Land Classification Delineated on Aerial Photograph

(See Table 11, pages 66-68, for symbol explanation)

Irrigable Lands

Irrigable lands are grouped in appropriate classifications according to their suitability for development under irrigated agriculture and their crop adaptability. Presently irrigated lands are included within these classifications, but urban lands and recreational lands are not classed as to irrigability. The time element with respect to when the lands might be developed did not enter into these determinations, except that suitability for irrigated agriculture was necessarily considered in light of present agricultural technology.

There are many factors which influence the suitability of land for irrigation development. Since soil characteristics and the physiography of the landscape are the most stable of these factors, they were the only ones considered in the survey in classifying lands as to their irrigability. The characteristics of the soil were established by examination of road cuts, ditch banks, and the material from test holes, together with observations of the type and density of native vegetation and crops. Representative slopes throughout the area were measured with a clinometer. Other aspects, such as those economic factors related to the production and marketing of climatically adapted crops, the location of lands with respect to a water supply, and climatic conditions, were not considered in the basic classification. These latter factors are very important in estimating the nature of future cropping patterns and practices, and will be given due consideration when estimates are made of future water requirements.

Urban Lands

It is recognized that future urban expansion will encroach upon some of the irrigable lands. The location and extent of this type of development is a function of many variables. Because this land classification survey

CLASSIFICATION OF LANDS IN
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT
(In acres)

Subunit and County	Irrigable agricultural lands								Urban lands (1958)	Recreational lands					Miscellaneous lands	
	Smooth lying			Gently sloping		Steeply sloping										
	V	Vl	Vw	H	Hp	M	Mp	Total	UD	RR	RC	RT	PP	Total	F	Vm
Beaver Humboldt County	150	0	0	110	0	10	20	290	30	50	0	0	0	50	5,630	0
Big Lagoon Humboldt County	850	0	100	1,550	200	640	0	3,340	350	80	10	10	1,430	1,530	6,870	140
Blue Lake Humboldt County	7,040	250	150	5,020	40	2,600	0	15,100	2,590	20	20	10	40	90	2,900	20
Butler Valley																
Humboldt County	260	0	30	670	0	110	20	1,090	60	10	0	40	0	50	13,110	0
Trinity County	0	0	0	30	0	0	0	30	0	20	0	20	0	40	100	0
Subunit Total	260	0	30	700	0	110	20	1,120	60	30	0	60	0	90	13,210	0
Little River Humboldt County	510	0	70	860	0	10	0	1,450	350	20	0	0	140	160	3,370	0
North Fork Humboldt County	20	0	10	90	0	190	0	310	170	20	0	0	20	40	1,630	0
Orick Humboldt County	1,280	0	90	80	10	10	0	1,470	270	0	10	10	8,940	8,960	8,000	0
Ruth Trinity County	260	310	0	140	10	0	0	720	30*	930	20	570	0	1,520	780	0
Snow Camp Humboldt County	90	0	50	0	0	30	0	170	0	10	0	20	0	30	5,480	0
County Totals																
Humboldt County	10,200	250	500	8,380	250	3,600	40	23,220	3,820	210	40	90	10,570	10,910	46,990	160
Trinity County	260	310	0	170	10	0	0	750	30*	950	20	590	0	1,560	880	0
Hydrographic Unit Total	10,460	560	500	8,550	260	3,600	40	23,970	3,850*	1,160	60	680	10,570	12,470	47,870	160

* Excludes 10 acres within Ruth Reservoir which were in urban development in 1958.

is an inventory of relatively unchanging physical conditions, no attempt was made to locate the areas of urban encroachment. Therefore, only those lands devoted to urban uses in 1958 are designated as "urban" lands.

Recreational Lands

Present trends indicate an expanding rate of use and demand for recreational facilities throughout the State. In view of these trends and the ever-increasing population, it is recognized that there will be a demand for substantial land areas for recreational purposes. This is particularly true of the mountainous and coastal regions where this type of development is expanding rapidly at the present time.

Generally speaking, all mountainous and coastal lands are suitable for some recreational use such as hunting, fishing, and similar outdoor activities. However, for purposes of this survey, lands classified for recreational use were limited to those which are now, or may in the future, be used intensively for permanent and summer home tracts, camp and trailer sites, and parks outside of urban areas. These are lands requiring intensiv water service.

Primary considerations for classification of home tracts and camp and trailer sites were such physical factors as soil depth, slope, and rocki ness; such aesthetic values as view, nearness to lakes, streams or seashore, or density and type of forest canopy suitable for the respective uses; and the plans of federal and state forest officials. An important factor in locating potential camp and trailer sites is the availability of a water supply. Isolation from existing roads did not influence classification.

The total areas of existing federal and state parks, rather than the specific areas of potential intensive development therein, are included with the recreational lands on Plate 3. For other parks, only the areas

at
irie Creek
edwoods
te Park

RECREATIONAL LANDS

Ruth Dam

and

Reservoir

presently developed to intensive recreational use are delineated. No attempt was made to predict where additional park developments will take place.

Other Lands

Irrigable forest and range lands are those lands having physical characteristics which make them suitable for irrigation development, but due to physiographic position, climatic conditions, and factors associated with their present utilization, they were classified as being best suited to remain under forest or range management.

Swamp and marshlands are those which generally have water standing on them and usually support a heavy growth of tules or other phreatophytes.

CHAPTER V. SUMMARY

This bulletin presents, for the Mad River-Redwood Creek Hydrographic Unit, basic data on land and water use, classification of lands, and a minimum of analysis of these data. Field surveys to obtain the data were conducted during 1958 and 1959 as part of a comprehensive inventory of water resources and requirements of California under authorization of the 1956 State Legislature. Determinations of future water requirements, the relationships of local water resources to these requirements, and the excess or deficiency of such resources within each watershed, which constitute the basic objectives of the investigation, will be made at a later stage.

This hydrographic unit comprises a 929-square-mile (594,410-acre) area in Humboldt and Trinity Counties. It comprises the watersheds of Mad River, Redwood Creek, and other smaller streams between them. The interior of the unit is mostly rugged, traversed from end to end by the narrow valleys of the two major streams. The rough terrain begins near the coast and rises to nearly 6,000 feet near the head of Mad River. The one significant variation to this pattern is a number of small coastal plains and/or benches.

Timber products constitute by far the largest industry and resource of the unit. This industry had its beginning in the 1850's, but has experienced its greatest growth since World War II. Agriculture is the second largest business, with dairy and horticultural products being the principal sources of farm income. The portion of farmlands under irrigation has increased from a negligible quantity to nearly half the cultivated acreage in the last 20 years. Of the land irrigated in 1958, over 90 percent was in pasture, and the bulk of the remainder in truck crops. Mineral production (mainly sand and gravel), recreation, and commercial fishing are the other enterprises of significance in the unit. The largest concentration of population within the unit is the unincorporated community of McKinleyville. Smaller urban areas are located at Blue Lake, Crannell, Fieldbrook, Maple Creek, Orick, and Trinidad, the oldest town in the Humboldt Bay district.

The information and data presented in this bulletin comprise:

- a brief description of the area, its climate, resources, and past and present development
- a tabulation describing the 68 systems used to divert surface waters, including locations, names of owners and sources, data on histories, apparent water rights, purposes, and extent of use in 1958
- a tabulation of quantities of water diverted by 40 of these diversion systems during 1958
- an estimate of consumptive use of water in 1958
- a tabulation of the acreages of various land uses in 1958
- a tabulation of acreages of various crops irrigated from each diversion and with ground water in 1958
- a tabulation of the classes of lands suitable for future irrigation and recreational uses.

Water Use

The results of a survey of surface water diversions within the unit in 1958, comprising an essential part of this report, were presented in Chapter II. The following paragraphs summarize these results.

There were 68 diversions of water from surface streams located in the unit in 1958, 65 of which were used. Of the total, 44 normally serve irrigation purposes, and of these only 42 were used in 1958. Small numbers of diversions are used for other purposes as follows: municipal-domestic, 8; industrial, 10; hydroelectric power, 4; fish culture, 1; and export for municipal use outside the unit, 1.

Surface water, in addition to supplying a little over half the irrigated lands of the unit, also provides a very good part of the supply for the numerous dairies, sawmills and log ponds. It also provides municipal and domestic supply for about a fifth of the unit's population, as well as the City of Eureka outside the unit. Ground water, on the other hand, meets some four-fifths of the domestic needs, mostly from privately owned wells, nearly half the irrigation needs, and a somewhat lesser part of the industrial supply.

Irrigation accounts for the major part of the consumptive use, municipal and industrial uses for somewhat lesser amounts; and some uses, such as hydroelectric power generation, are virtually nonconsumptive. The total consumptive use of applied water in the unit in 1958 is estimated to have been 4,500 to 5,000 acre-feet.

Most of the 68 diversions in the unit are based on riparian rights or on appropriative rights obtained by application to the State since enactment of the California Water Commission Act in 1914. As of October 1, 1960, there were a total of 88 valid applications pertinent to surface waters within the unit. Permits or licenses had been granted for 80 of these applications, while the other 8 were either pending or incomplete.

Present Land Use

A second portion of the investigation reported herein is the survey of the uses of land in the unit in 1958, details of which are described in Chapter III.

The acreages of land devoted to various uses in the Mad River-Redwood Creek Hydrographic Unit, as indicated by the 1958 survey, which are tabulated in detail in Tables 9 and 10, are summarized as follows:

Type of Use	Humboldt County		Trinity County		Hydrographic Unit*	
Agricultural						
Lands irrigated in 1958	3,150		30		3,180	
Lands usually irrigated but idle or fallow in 1958	140		20		160	
Meadowlands	500		0		500	
Dry-farmed	3,990		20		4,010	
		7,780		60		7,840
Recreational						
Residential	120		110		230	
Commercial	30		20		50	
Campsites	20		10		30	
Parks	10,570		0		10,570	
		10,740		140		10,880
Urban		3,820		40		3,860
Native vegetation		470,570		101,100		571,670
Marshlands		160		0		160
TOTALS		493,070		101,340		594,410

---

*The relative amounts of each of these types of use are shown in Figure 1, page 79.

Of the 3,340 acres of land under irrigation, 160 were idle, 1,540 were irrigated with ground water, and 1,640 with surface water.

Land Classification

The third survey covering the Mad River-Redwood Creek Hydrographic Unit was the classification of lands as to suitability for irrigated agriculture and recreational development. This survey was discussed in Chapter IV, and is reviewed briefly below.

The results of the land classification survey conducted for this investigation, which are tabulated in detail in Table 12, are summarized below:

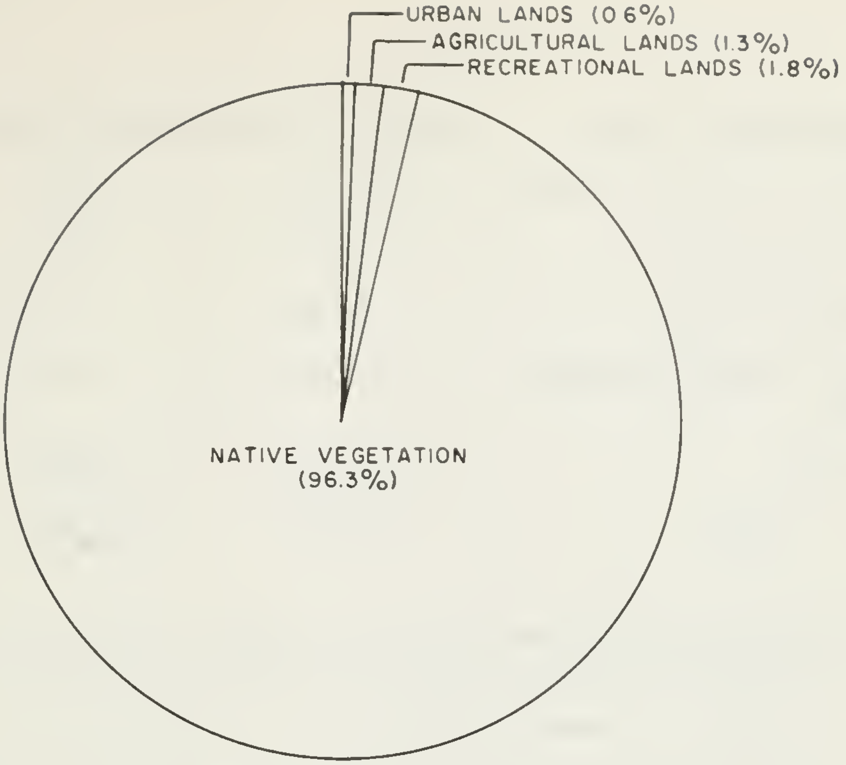


Figure 1

1958 LAND USE IN MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

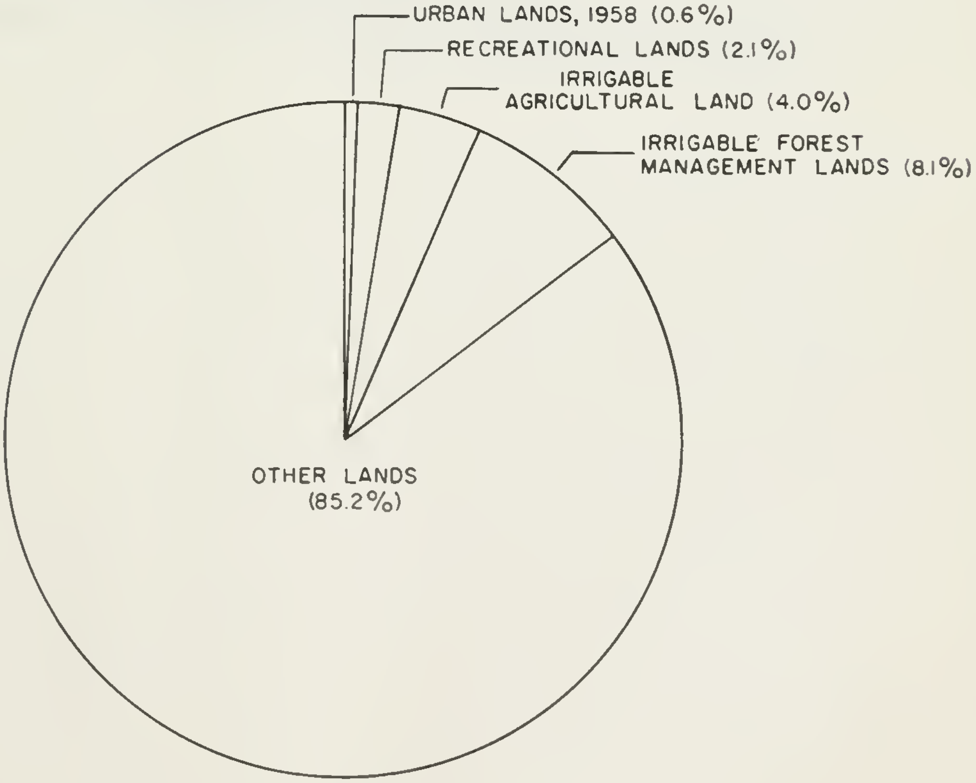


Figure 2

CLASSIFICATION OF LANDS IN MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

Classification groups	Humboldt County	Trinity County	Hydrographic Unit
Irrigable agricultural lands	23,220	750	23,970
Recreational lands	10,940	1,560	12,500
Developed urban lands	3,820	30**	3,850**
Irrigable forest management lands	46,990	880	47,870
Other lands	408,090	98,120	506,210
TOTALS	493,070	101,340	594,410

---

*The relative amounts of each of these groups are shown in Figure 2, Page 79.

**Does not include 10 acres of 1958 urban land use now within Ruth Reservoir

Some significant concentrations of certain classes are noted below:

- Over 70 percent of the presently developed urban lands are in Blue Lake Subunit, adjacent to the Humboldt Bay-Eureka area.
- Over 60 percent of the irrigable agricultural lands of the unit are in the Blue Lake Subunit.
- About 80 percent of residential and campsite recreational lands are in the Ruth Subunit.

APPENDIX A

STATEWIDE WATER RESOURCES AND WATER REQUIREMENTS STUDIES

APPENDIX A

STATEWIDE WATER RESOURCES AND WATER REQUIREMENTS STUDIES

California's major water problem today is that of development and delivery of supplemental water supplies to meet increasing water requirements throughout the State. The problem involves (1) the regulation of seasonal and cyclic fluctuation of streamflow to meet demand schedules in the areas of origin, and (2) the transmission of regulated surplus flows over long distances to areas of deficiency. The development and long-distance transfer of water are currently accomplished by such major facilities as the federal Central Valley Project and the Colorado River Aqueduct of The Metropolitan Water District of Southern California. In the future, such development and transfer of water will be considerably broadened by the presently authorized State Water Facilities, by future projects of the California Water Resources Development System, and by additions to the Central Valley Project.

Consumptive water requirements of the State on a basin wide basis were estimated in State Water Resources Board Bulletin No. 2, "Water Utilization and Requirements of California," June 1955. The Trinity County portion of this unit was also studied in the "Northeastern Counties Investigation," Bulletin No. 58, June 1960. However, to provide for local water needs while considering specific export projects, more detailed information must be made available on present and projected future water requirements of the areas in which the projects are to be built. This will necessitate the considerably more detailed collection and analysis of data on hydrology, land use and land capability, and economics.

Recognizing that additional information is needed if the water needs of areas of origin are to be adequately protected in large-scale water development projects, the 1956 Legislature authorized an investigation to determine the water resources and water requirements of the respective watersheds in the State. The legislation authorizing this investigation, codified in Section 232 of the Water Code, is as follows:

> "232. The Legislature finds and declares that in providing for the full development and utilization of the water resources of this State it is necessary to obtain for consideration by the Legislature and the people, information as to the water which can be made available for exportation from the watersheds in which it originates without depriving those watersheds of water necessary for beneficial uses therein. To this end, the department is authorized and directed to conduct investigations and hearings and to prepare findings therefrom and to report thereon to the Legislature at the earliest possible date with respect to the following matters:
>
> (a) The boundaries of the respective watersheds of the State and the quantities of water originating therein;
>
> (b) The quantities of water reasonably required for ultimate beneficial use in the respective watersheds;
>
> (c) The quantities of water, if any, available for export from the respective watersheds;
>
> (d) The areas which can be served by the water available for export from each watershed; and
>
> (e) The present use of water within each watershed together with the apparent claim of water right attaching thereto, excluding individual uses of water involving diversions of small quantities which, in the judgment of the Director of Water Resources, are insufficient in the aggregate to materially affect the quantitative determinations included in the report.
>
> "Before adopting any findings which are reported to the Legislature, the department shall hold public hearings after reasonable notice, at which all interested persons may be heard."
> (Added by Stats. 1956 (Ex. Sess.), Ch. 61; amended by Stats. 1959, Ch. 2025.)

For purposes of this investigation, the State has been divided into 12 major hydrographic areas. These areas, in turn, have been subdivided into hydrographic units generally comprising watersheds of individual rivers. These watersheds will be field surveyed in some detail, and, where previous detailed studies have been made, the information will be brought up-to-date. Water resources and water requirements will be determined and reported in a bulletin for each of the hydrographic areas. Since many years are required to gather sufficient data for adequate analysis of water resources and water requirements, surveys of present land and water use will be made, and the data published separately for each of the hydrographic units. This procedure will make the land and water use data available sooner than would otherwise be possible. Bulletin No. 94-7, "Land and Water Use in Mad River-Redwood Creek Hydrographic Unit," is the seventh of a series reporting the results of these surveys.

At a future date, estimates, largely based on the land and water use surveys, will be made of quantities of water reasonably required for future beneficial use in each watershed. The quantity of water potentially available for export from each watershed will be determined after allowances are made for the satisfaction of the local requirements and prior rights to divert water to other areas. For those watersheds in which no exportable water is available, the water supply deficiency will be determined. These estimates will be published as they become available, in such form as to make possible a county-by-county determination.

The calculations of future water requirements will be based, in part, on predicted future land uses derived from land classification surveys, economic studies, population forecasts, industrial and agricultural development, and recreational needs. Agricultural water requirements will be based on unit water use by the various predicted crop types; urban and recreational requirements on per capita water use values; fish and wildlife requirements on minimum streamflow needed or water demands for wildlife area; and industrial water requirements on measured water deliveries to various types and sizes of industries now existing. In forecasting future industrial development, water quality problems will be given full consideration.

Water resources will be determined from records of all stream gaging stations, including new stations which were established for this and other investigations of the department. The new stations were generally constructed on streams which originate in the smaller watersheds for which runoff data are necessary, but for which no data have been available. One new stream gaging station requested for use by this investigation was added to the existing network of stations in the Mad River-Redwood Creek Hydrographic Unit. This station was installed on North Fork Mad River near Blue Lake in October 1957.

Determination of the sequence and approximate dates of future projects, as well as their individual engineering features, is of vital importance in proper planning to meet California's growing water demand. In order to have a construction schedule in advance of the need, staging studies have been initiated. These studies, the collection, processing, and publication of basic data such as presented herein, determination of the water resources and future water requirements of the State, and certain other closely related studies now constitute the department's Water Requirements and Project Staging Program.

APPENDIX B

REFERENCES AND REPORTS ON RELATED INVESTIGATIONS

APPENDIX B

REFERENCES AND
REPORTS ON RELATED INVESTIGATIONS

Prior reports and documents reviewed in connection with the investigation of land and water use in the Mad River-Redwood Creek Hydrographic Unit include the following:

Andrews, R.W. "Redwood Classic." 1958.

Bancroft, Hubert H. "History of the Northwest Coast." Volume 1.

California State Chamber of Commerce. "Economic Survey of California and Its Counties." 1958.

California State Department of Fish and Game. "The Commercial Fish Catch of California." Bulletins, 1946-1958.

----. "The Marine Fish Catch of California for 1955 and 1956." Bulletin 105.

California State Department of Natural Resources, Division of Mines. "Mineral Information Service Bulletin." Annual production issues, 1950-1961.

----. "Geologic Reconnaissance of the Northern Coast Ranges and Klamath Mountains, California With a Summary of the Mineral Resources." Bulletin 179. 1960.

California State Department of Water Resources. "The California Water Plan." Bulletin No. 3. May 1957.

----. "State Water Right Applications for Unappropriated Water, Assignment Thereof, Reservations for Counties of Origin, and Other Related Matters." January 1959.

----. "Northeastern Counties Investigation." Bulletin No. 58. June 1960.

----. "Progress Report on North Coastal Area Investigation." May 1961.

California State Water Resources Board, "Water Resources of California." Bulletin No. 1. 1951.

----. "Water Utilization and Requirements of California." Bulletin No. 2. 1955.

California, University of, Agricultural Extension Service. Bulletin No. 748.

Coy, Owen C. "The Humboldt Bay Region, 1850-1875." 1929.

Hamm, Lillie E. "History and Business Directory of Humboldt County." 1890.

Hoener, Edgar P. "Timberman." 1950-1956.

Hoover, M. B. "Historic Spots in California (Counties of the Coast Range)." 1937.

Melendy, Howard B. "One Hundred Years of the Redwood Lumber Industry, 1850-1950." 1952.

Miller Freeman Publications. "Timberman." 1957-1960.

----. "Lumberman." 1950-1960.

----. "Directory of Forest Products Manufacturers, 1950-60."

United States Department of Commerce, Bureau of the Census. "Census of Agriculture, 1935." Volumes 1 and 2.

----. "Irrigation of Agricultural Lands, 1940."

----. "Census of Agriculture, 1945." Volume 1.

United States Department of the Interior. "Eighth Census, Statistics of Agriculture, 1860."

APPENDIX C

LEGAL CONSIDERATIONS

TABLE OF CONTENTS

LEGAL CONSIDERATIONS

Page

California Water Rights C-3

Riparian Rights C-4

Overlying Rights C-5

Appropriative Rights C-5

Prescriptive Rights C-8

Determination of Water Rights C-9

Litigation Concerning Local Water Rights C-9a

Applications to Appropriate Water C-9a

TABLES

Table No.

C-1 Applications to Appropriate Water in Mad River-Redwood Creek Hydrographic Unit C-10

APPENDIX C

LEGAL CONSIDERATIONS

There are set forth in the following paragraphs brief general tatements with respect to the California law of water rights to supplement nd to provide a background for information on water rights contained in hapter II. Also included is a tabulation of currently active applications o appropriate water within Mad River-Redwood Creek Hydrographic Unit filed ith the State Water Rights Board.

California Water Rights

In California, water rights convey only the right to use water. ntil absolute possession of water is acquired by some artificial means, o one owns water. However, the owner of water rights is entitled to njoy them without interference by other users who have rights which are nferior to his.

Five kinds of water rights are recognized in California. These re riparian, overlying, appropriative, prescriptive, and pueblo. Riparian ights attach to surface water and water flowing in known and definite ubterranean channels, while overlying rights attach only to underground ater. Appropriative and prescriptive rights may be acquired in either urface or underground waters. Pueblo rights are now exercised in alifornia only by the cities of Los Angeles and San Diego, each of which as a paramount right to satisfy its full needs from the stream system of aters flowing by the former Mexican pueblo from which each sprang.

All water rights, both to surface and to underground water, are ubject to the doctrine of reasonable beneficial use expressed in Section 3 f Article 14 of the California Constitution, and Water Code Sections 100 nd 101. This doctrine limits water rights to the quantity of water reasonably required for beneficial use and prohibits waste, unreasonable use, and unreasonable methods of use or diversion.

Riparian Rights

A riparian right entitles the owner of lands which border or front on a watercourse to take water therefrom for use on such lands within the same watershed. However, the rights of the owner of riparian land are limited to the reasonable beneficial use of the natural flow of water which passes his land. Riparian rights pass with the title to the land, unless expressly reserved or excepted from the interests transferred, and are not gained by use or lost by mere nonuse. Although the land must be contiguous to the watercourse, the length of the frontage is not determinative of the rights; a large tract with a small frontage on a stream may be riparian to the stream. But the original grant determines the character of the land, and only the smallest contiguous tract held under a single title retains riparian rights.

A riparian owner has no right to any specified amount of the water of a stream as against other riparian owners. He has rights only to a reasonable share from the stream -- a correlative right which he shares mutually with other riparian owners. In the event of insufficient water for all, the available supply must be apportioned, except that an upper riparian owner may take the whole supply if necessary for domestic use. As against appropriators, the riparian owner has the paramount right to all the water of the stream which he can put to reasonable beneficial use, but that is the extent of his rights, and the appropriator can take the surplus.

Riparian rights do not authorize use of water on nonriparian land, nor do they permit the seasonal storage of water. Neither do they prevent temporary appropriation by others of water not presently needed for use on riparian land.

A parcel of land becomes nonriparian when severed from land bordering the stream, unless the riparian rights are reserved for the severed parcel by the grantor. Riparian rights may be destroyed when purportedly transferred apart from the land by grant, contract, or condemnation, and may be impaired or lost through prescription.

Overlying Rights

Owners of lands overlying a common underground water supply have the right to withdraw water for reasonable beneficial use on their overlying lands. Such overlying rights are analogous to riparian rights, in that both are based on ownership of land, and the rights of each overlying owner are mutual and correlative to the rights of all other owners. In the case of insufficient water to fully supply the requirements of all, the available supply must be equitably apportioned.

Overlying rights do not include use of water on nonoverlying land. However, surplus water not presently required for beneficial use on overlying land, and which may be withdrawn without creating an overdraft on the ground water supply, may be appropriated for use on nonoverlying land. But the overlying rights are paramount and all appropriative rights are subject to the future requirements of overlying land.

Appropriative Rights

An appropriation of water is any taking of water for other than riparian or overlying uses, whether such taking is from the underground by wells or from surface streams by direct diversion or storage. An appropriator, in the legal sense, is one who initially takes water without possessing rights which are based on the ownership of land. As between appropriators, the one first in time is first in right. A prior appropriator may take all the water he needs up to the full amount to which he is entitled before a later appropriator may take any.

Normally, appropriative rights are inferior to riparian rights. An exception to this is the case of an appropriation of water diverted from streams flowing through vacant public lands before the riparian lands were withdrawn from the domain of the United States. The appropriative diversions or the lands they serve may be either upstream or downstream from the riparian lands. Any water not needed for the reasonable beneficial uses of those having prior rights may properly be appropriated.

No formal or statutory procedure is or ever has been prescribed or required in this state for those who take water by means of wells from underground percolating waters or underground basins. An appropriative right to take surplus water from such sources is acquired by extracting such water from the underground and applying it to beneficial uses.

Provided the development and application to use are completed with reasonable diligence, the priority of the right as against another appropriator related back to the first substantial act toward putting the water to use or to the date of application. Until 1872, water flowing in natural streams was appropriated by taking the water.

Sections 1410 through 1422 of the Civil Code, enacted in 1872, established a permissive procedure for perfecting an appropriation of surface water. Provision was made for posting a notice of appropriation at the proposed point of diversion and recording a copy with the county recorder. If the statutory procedure were followed and the appropriation completed with due diligence, priority related back to the date of posting; otherwise, priority was established only when the water was put to beneficial use.

Since the effective date of the Water Commission Act of 1913, December 19, 1914, appropriation of surface water and water in subterranean streams flowing in known and definite channels has been by compliance with required statutory procedure. An appropriation of such water now can be made in accordance with the provisions of Part 2, Division 2 of the Water Code (Water Code Sections 1200 to 1801). An application to appropriate unappropriated water must be filed with the State Water Rights Board. If the application is approved, a permit is issued authorizing the appropriation. When the appropriation has been completed, an inspection is made and a license is issued, to the extent of beneficial use, provided the terms and conditions of the permit have been fulfilled. The priority of a permit or license relates back to the date of the application.

A right to appropriate water may be lost either by abandonment or by continuous nonuse. To constitute abandonment, there must be concurrence of act and intent, wherein possession is relinquished with no intent to resume it for a beneficial use. Abandonment is, therefore, always voluntary and factual. In the case of an appropriation initiated prior to 1914, continuous nonuse for a period of five years results in the loss of appropriative water rights. In the case of appropriative rights acquired pursuant to the Water Commission Act or the Water Code, continuous nonuse for a period of only three years may result in loss of such rights.

Where ground water and surface water are interconnected, one acting as a tributary to the other, both are treated as part of a common supply and users of water from either source are entitled to protection from substantial injury as a result of use by others of water from the other source. Thus, an owner of land riparian to a stream may have his right to the use of water protected against impairment by an appropriator of percolating ground water tributary to the stream and required for the maintenance and support of its flow. Likewise, where water from a stream percolates to a ground water basin or stratum, the owner of land overlying the ground water supply may be protected from an appropriation of water from the stream if this causes a substantial impairment of the ground water supply. As between riparian use of surface water and overlying use of ground water tributary to the stream, a sharing of the available water supply on the basis of reasonable beneficial use should be made.

Prescriptive Rights

It is possible to appropriate surface or ground water which is presently needed by others to satisfy riparian, overlying, or prior appropriative rights. Such appropriations may ripen into prescriptive rights where the use is actual, open and notorious, hostile and adverse to the original owners, continuous and uninterrupted for the statutory period of five years, made under claim of right, and with payment of taxes whenever such have been levied on the water rights. Absence of any of these essentials precludes the acquisition of prescriptive water rights.

Prescription of a right thus requires that, for a period of five years, the rightful owner either knows or should know of the adverse taking and fails to take any physical or legal steps to interrupt such taking. Irrespective of the needs or demands of the riparian, overlying, or prior appropriative user, an absolute right to only a fixed amount of water may be acquired by prescription. The quantity of such a right is determined by beneficial use. However, present use is the measure of the prescriptive right, and future needs cannot be included.

Riparian rights, overlying rights, appropriative rights, and prescriptive rights may be lost or diminished by prescription. While there is sufficient water flowing in a stream to supply the wants of all parties, the use of the water by anyone does not deprive the others of their water supply and, hence, is not an invasion of their rights. The same principle applies to a downstream diversion of water as against the rights of an upstream riparian landowner or prior appropriator. At times when the safe yield of a ground water basin exceeds the needs of overlying landowners and appropriators, their prior rights are not invaded by a later appropriative taking of water from the underground supply. The later appropriation becomes adverse only when the ground water basin is overdrawn; that is, when the annual draft exceeds the safe annual yield. Although neither an overlying owner nor a prior appropriator may prevent a taking of surplus water, either the owner or the appropriator may institute legal proceedings to safeguard the supply once a surplus ceases to exist, and may enjoin any additional use beyond the point of safe yield. Since prescriptive rights can only be acquired to non-surplus water, these rights cannot ordinarily be acquired against the future needs of riparian or overlying owners.

The prior appropriator, lower riparian, or overlying owner may protect his rights for his present needs against an adverse appropriator by actually taking the needed water before the five-year period has run, or by the aid of the courts in the form of a declaratory judgment or injunction within the five-year period.

Determination of Water Rights

Under provisions of the Water Code, actions brought before either state or federal courts which involve determination of rights to the use of water may, at the court's discretion, be referred to the State Water Rights Board. Under provisions of Water Code Section 2000, the court may appoint the board to referee "any or all issues involved in the suit," or under Section 2001, it may limit the reference to "investigations of and report upon any or all physical facts involved." This reference procedure may be followed in suits involving either surface or ground waters, or both.

An alternative procedure for adjudication of rights to the use of water of streams, lakes, and other bodies of water, is available upon petition to the State Water Rights Board, but the method excludes the determination of rights to take water from an underground supply other than from a subterranean stream flowing through known and definite channels. Water Code Sections 2500 to 2900, inclusive, authorize the initiation of such proceedings.

Litigation Concerning Local Water Rights

There has been no major adjudication of water rights in the Mad River-Redwood Creek Hydrographic Unit. Consequently, neither the State Water Rights Board nor any of its predecessor agencies has been involved in a court reference and state watermaster service has not been established.

Applications to Appropriate Water

Applications to appropriate water within the Mad River-Redwood Creek Hydrographic Unit, filed with the State since 1914 and active on October 1, 1960 are summarized in Table C-1. For each application relative to a diversion reported in Chapter II the diversion location is included in the table. The status of each application as to the granting of a permit or license is also shown in the table.

TABLE C-1

APPLICATIONS TO APPROPRIATE WATER IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

(Filed with State Water Rights Board as of October 1, 1960)

Application number	Date filed	Present owner	DWR** diversion location	Source	Location of point of diversion						Amount	Period of diversion	Purpose	Status*
					1/4	1/4	Sec	Tp	R	B & M				
5097	7/12/26	Percy J. Jackson	--	Green Point Creek	SE	NE	15	6N	3E	H	.028 cfs	May 1-Nov 1	Irrigation, 2.25 acres	L-927
6361	7/6/29	Nick V. and Maybelle A. Tompkins	--	Littlefield Creek	SW	NE	31	2S	8E	H	0.57 cfs	Jan 1-Dec 31 May 15-Jul 1	Domestic Irrigation, 15 acres	L-1373
6832	11/17/30	Estate of Minnie A. Kell	--	Spring tributary to Mad River	SE	SW	7	3N	4E	H	0.038 cfs	Jan 1-Dec 31 Jun 1-Oct 1	Domestic Irrigation, 3 acres	L-1641
7476	12/29/32	William F. Silva	6N/1E-7J1	Mad River	NE	SE	7	6N	1E	H	0.8 cfs	Jun 1-Sept 15	Irrigation, 100 acres	L-1511
7502	2/14/33	Fred and Mary Mathis	--	McNeill Creek	SW	SE	11	8N	1W	N	3,000 gpd	Jan 1-Dec 31	Domestic	L-2427
7545	4/27/33	Frank E. Kelly, Mrs. M. T. Holland, Mrs. J. C. Wallace, Rita Regli, Ella J. Kelly, and Sophia Kelly	--	Mad River	SW NW	SE NE	24 25	6N 6N	1E 1E	H H	0.12 cfs	May 1-Sept 1	Irrigation, 10 acres	L-2084
7621	7/17/33	City of Eureka	5N/2E-16G1	Mad River	SW SE	NE NW	16 16	5N 5N	2E 2E	H N	750 af 7.74 cfs	Oct 1-Jun 30 Jan 1-Dec 31	Municipal	P-4444
7703	10/9/33	Rowena J. Townsend	8N/1E-32M1	Tributary to Pacific Ocean Tributary to Pacific Ocean	NW NE	SW SE	32 31	8N 8N	1E 1E	H H	31,000 gpd	Jan 1-Dec 31	Municipal	L-2630
7713	10/20/33	Mary, Attilio, John, Lillian, Hazel, and Esther Pifferini	6N/1E-7L1	Mad River	SE	NW	7	6N	1E	H	0.17 cfs	Jul 1-Aug 31	Irrigation, 40 acres	L-1664
7804	1/8/34	Edward Letter	--	Mad River	NW	SE	7	6N	1E	H	0.13 cfs	May 1-Sept 30	Irrigation, 25 acres	L-1660
7898	4/9/34	Simpson Redwood Company	--	Tributary to Wilson Creek	SW	NE	1	3N	3E	H	1,000 gpd	Jan 1-Dec 31	Domestic	L-175[illegible]
8360	6/17/35	Dr. and Mrs. C. G. Wiggins	--	Mad River	SW	SW	5	4N	3E	N	0.018 cfs	Jul 1-Sept 15	Irrigation, 3 acres	L-2386
8391	7/13/35	State of California Department of Fish and Game	11N/1E-23A1	Lost Man Creek	NE	NE	23	11N	1E	H	1.86 cfs	Jan 1-Dec 31	Recreational, domestic, and fish culture	L-2355
8881	1/25/37	Meta H. Moore	--	Mad River	NW NE	SE SW	8 8	6N 6N	1E 1E	N H	0.36 cfs	Jun 1-Oct 15	Irrigation, 18 acres	L-[illegible]457
8912	3/3/37	Jay and Emma Powell and Roland and Eleanor Johnson	--	Mill Creek	NE	SE	23	8N	1W	H	6,900 gpd	Jan 1-Dec 31	Domestic	L-3733
9140	10/7/37	State of California Division of Highways	--	Mill Creek	NE	SE	23	8N	1W	H	3,000 gpd	Jan 1-Dec 31	Industrial and domestic	L-[illegible]306
9191	11/29/37	Cora H. Taylor	--	Fishes Mill Creek	SE	SE	6	6N	1E	H	0.03 cfs	Jan 1-Dec 31	Domestic	L-2703
9292	5/16/38	Blanche W. Slaughter and John A. and Florence Warren	--	Spring tributary to Mad River	SE	NW	7	3N	4E	H	7,000 gpd	Jan 1-Dec 31	Domestic	L-2556
9354	7/21/38	Paul R. Gustavson	--	Hobson Creek	NE	NE	14	8N	1W	H	4,800 gpd	Jan 1-Dec 31	Domestic	L-4823
9486	1/16/39	E. C. Mead, Bertha E. Mead, and Annabel Mead Murray	--	Tompkins Creek	SW	NE	23	2S	7E	N	150 gpd	May 1-Oct 30	Domestic	L-2782
9850	3/12/40	Mrs. Zelda Douglas	--	Widow White Creek	NW	NE	31	7N	1E	N	0.18 cfs	Mar 1-Nov 15	Irrigation, 25 acres	L-3269
9902	5/21/40	G. Millard and Thelma J. Foster	--	McNeill Creek	SW	SW	11	8N	1W	H	0.06 cfs	Jan 1-Dec 31 May 1-Nov 1	Domestic Irrigation, 15 acres	L-3192

* P - Indicates permit number of application approved. L - Indicates license number of right confirmed. Incomplete - Indicates application not yet complete. Pending - Indicates application complete but not yet approved.
** Diversion of 10 acre-feet or more per year located by Department of Water Resources.

TABLE C-1 (Continued)

APPLICATIONS TO APPROPRIATE WATER IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

(Filed with State Water Rights Board as of October 1, 1960)

Application number	Date filed	Present owner	DWR** diversion location	Source	Location of point of diversion						Amount	Period of diversion	Purpose	Status*
					1/4	1/4	Sec	Tp	R	B & M				
10097	1/4/41	City of Blue Lake	6N/2E-21C1	Tributary to North Fork Mad River	NE	NW	21	6N	2E	H	0.045 cfs	Jan 1-Dec 31	Municipal	L-2861
10317	11/12/41	Carl Martin	7N/1E-32F1	Widow White Creek	SE	NW	32	7N	1E	H	0.03 cfs	Jul 1-Oct 1	Irrigation, 3 acres	L-4547
10351	1/2/42	John D. Daily	7N/1E-31C1	Widow White Creek	NE	NW	31	7N	1E	H	0.05 cfs	May 1-Oct 1	Irrigation, 6 acres	L-2954
10510	7/16/42	United States Six Rivers National Forest	—	Spring tributary to Mad River	NW	SW	34	1S	7E	H	1,500 gpd	Jan 1-Dec 31	Domestic	L-2825
10620	3/31/43	John Branscom	—	Deadman Creek	SW	NW	30	8N	1E	H	350 gpd	Jan 1-Dec 31	Domestic	L-3477
10767	2/14/44	Joseph W. Maneses and Estate of Diolinda Maneses	—	Spring tributary to North Fork Widow White Creek	NW	SE	29	7N	1E	H	2,500 gpd	Jan 1-Dec 31	Domestic and stockwatering	L-3083
11039	5/7/45	Elgin O. Edeline	8N/1E-31D1	Luffenholtz Creek	NW	NW	31	8N	1E	H	1.13 cfs	Jan 1-Dec 31	Power	L-3542
11128	8/9/45	Wallace A. Turner	—	Mill Creek	NW	NE	7	6N	1E	H	0.25 cfs	May 1-Nov 1	Irrigation, 20 acres	L-3336
11185	10/19/45	Henriette Reimann Hartman	7N/1E-18B1	Patrick Creek	N½	NE	18	7N	1E	H	0.9 cfs	May 1-Nov 1	Stockwatering and irrigation, 175 acres	L-3713
11299	3/4/46	Nick V. and Haybelle A. Tompkins	—	Spring tributary to Littlefield Creek	NW	NW	32	2S	6E	H	2,100 gpd	Jan 1-Dec 31 Jun 1-Oct 1	Domestic and stockwatering Irrigation, 1.5 acres	L-3807
11369	4/12/46	United States Six Rivers National Forest	—	Spring tributary to Mad River	NE	SW	2	1S	6E	H	150 gpd	May 1-Oct 31	Recreational	L-3235
11497	8/5/46	Mr. and Mrs. Frank W. Mayer	—	Mobson Creek	NE	NW	14	8N	1W	H	0.08 cfs	Jan 1-Dec 31 Jun 1-Oct 31	Domestic Irrigation, 9 acres	L-3363
11508	8/12/46	Roddiscraft, Inc.	--	Mad River	NE	NW	16	6N	1E	H	0.31 cfs 30 af	Jan 1-Dec 31 Jan 1-Dec 31	Industrial, domestic, and fire protection	L-3126
11510	8/14/46	A. W. Thoma	7N/1E-17E1	South Fork Patrick's Creek	SW	NW	17	7N	1E	H	0.18 cfs	May 1-Oct 1	Irrigation, 20 acres	L-4352
11983	7/14/47	E. C. Mead, Bertha E. Mead, and Annebel Mead Murray	—	Tompkins Creek	SW	NE	23	2S	7E	H	850 gpd	Mar 15-Dec 1	Domestic	L-3907
12233	1/9/48	City of Blue Lake	6N/2E-21C1	Tributary to North Fork Mad River	NE	NW	21	6N	2E	H	21,000 gpd	Jan 1-Dec 31	Municipal	L-5012
12653	8/16/48	Edgar Lax	—	Captain Creek	SW	SE	11	6N	3E	H	14,000 gpd	Jan 1-Dec 31 Apr 15-Oct 15	Domestic Irrigation, 1 acre	L-3749
12654	8/16/48	Loftus Grey	--	Captain Creek	SW	SE	11	6N	3E	H	5,760 gpd	Jan 1-Dec 31	Domestic	L-4706
12959	3/4/49	Hammond Lumber Company	9N/1E-19G1	Gray Creek	SW	NE	19	9N	1E	H	1 cfs 780 af	Jan 1-Dec 31 Nov 1-Mar 1	Industrial	L-3536
13523	12/29/49	George M. and Irma P. Holt	—	Spring tributary to Mad River	NW	SW	21	1N	6E	H	110 gpd	Jan 1-Dec 31	Domestic	L-4919
13693	4/17/50	David S. Ward	7N/1E-8R1	Bulwinkle Creek	SE	SE	8	7N	1E	H	0.19 cfs	Mar 1-Nov 1	Irrigation, 20 acres	L-4818
13978	10/4/50	Harold E. and Sibyl M. Jamieson	—	McConnaha's Mill Creek (New Mill Creek)	NW	NW	25	8N	1W	H	1,000 gpd	Jan 1-Dec 31	Domestic	L-4326
14063	11/20/50	Roddiscraft, Inc.	4N/3E-6M1	Boulder Creek	NE	SE	6	4N	3E	H	0.12 cfs	Jan 1-Dec 31	Industrial and fire protection	L-4858
14216	3/28/51	State of California Division of Forestry	8N/1W-14K1	Tributary to Pacific Ocean	NW	SE	14	8N	1W	H	0.035 cfs	Jan 1-Dec 31	Domestic and fire protection	L-4519

* P - Indicates permit number of application approved. L - Indicates license number of right confirmed. Incomplete - Indicates application not yet complete. Pending - Indicates application complete but not yet approved.

** Diversion of 10 acre-feet or more per year located by Department of Water Resources.

APPLICATIONS TO APPROPRIATE WATER IN
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

(Filed with State Water Rights Board as of October 1, 1960)

Application number	Date filed	Present owner	DWR** diversion location	Source	Location of point of diversion						Amount	Period of diversion	Purpose	Status*
					¼	¼	Sec	Tp	R	B & M				
14360	6/25/51	Simpson Redwood Company	--	Beaver Creek	NE	SW	5	7N	3E	H	4,000 gpd	Jan 1-Dec 31	Domestic	L-4753
14465	9/6/51	Eugene W. and Edith Blake	--	Underwood Creek	NE	NW	29	7N	1E	H	6,000 gpd	Jan 1-Dec 31 May 1-Sept 30	Domestic Irrigation, 8 acres	L-4629
14475	9/11/51	Timber Inc. of California	--	Molasses Creek	SW	SE	8	7N	3E	H	48 af	Feb 1-Nov 1	Industrial and fire protection	L-4269
14519	10/15/51	Edward Charles Bott	7N/1E-18H1	Patrick Creek	SE	NE	18	7N	1E	H	0.24 cfs	May 21-Oct 31	Irrigation, 50 acres	L-4563
14669	2/11/52	Roy Duncan	--	Spring tributary to Redwood Creek	SE	NE	5	10N	1E	H	3,000 gpd	Jan 1-Dec 31	Domestic	L-5906
14677	2/14/52	Melvin P. Roberts, Jr.	--	Mad River	Movable diversion point between NW and NE	NE SE	31 31	6N 6N	2E 2E	H H	0.38 cfs	May 1-Oct 1	Irrigation, 30 acres	L-5103
14831	5/28/52	Ralph Dunn	--	Underwood Creek	NE	NW	29	7N	1E	H	500 gpd	Jan 1-Dec 31	Domestic	L-5050
15085	11/17/52	John R. and Albert H. Forrest	7N/1E-17R2	Tributary to Strawberry Creek	SE	SE	17	7N	1E	H	0.28 cfs	May 15-Oct 15	Irrigation, 40 acres	L-5099
15325	5/1/53	Alexander G. Bossinas	--	Tributary to Peach Creek	NW	NW	35	9N	1W	H	15,000 gpd	Jan 1-Dec 31	Fish culture	L-5111
15328	5/1/53	Jess A. Luster	7N/1E-27H1 7N/1E-27A1 7N/1E-27R1	Lindsay Creek Lindsay Creek Lindsay Creek Lindsay Creek Lindsay Creek	NW NW SE SE SE	NW NW NE SE SE	26 26 27 27 27	7N 7N 7N 7N 7N	1E 1E 1E 1E 1E	H H H H H	0.14 cfs	Jun 1-Sept 30	Irrigation, 30 acres	L-5235
15336	5/11/53	Charles H. Feldmiller	--	Spring tributary to Mad River	SW	NW	21	1N	6E	H	2,200 gpd	Jan 1-Dec 31	Domestic	L-5222
15997	8/13/54	Mary Fischer Kretner	--	Maple Creek	NW	NW	6	4N	3E	H	100 gpd	Apr 1-Nov 1	Domestic	L-5293
16452	7/7/55	City of Eureka	--	Mad River Underflow	NW	NE	25	6N	1E	H	2.32 cfs	Jan 1-Dec 31	Municipal	P-10342
16454	7/7/55	Humboldt Bay Municipal Water District	--	Mad River Rediversion:	NW NW	NW NE	19 15	1S 6N	7E 1E	H H	100,000 af	Oct 1-Apr 30	Municipal	P-11714
16562	8/31/55	Mr. and Mrs. N. G. Cottrell	--	Mad River	NE	SW	27	1N	6E	H	500 gpd	Jan 1-Dec 31	Domestic	P-10396
16756	11/30/55	State of California Division of Highways	7N/3E-31C1	Tributary to Long Prarie Creek	NE	NW	31	7N	3E	H	0.031 cfs	Jan 1-Dec 31	Domestic	L-5573
17049	4/24/56	California Water Commission	--	Mad River	-	NE	17	1N	6E	H	500,000 af	Jan 1-Dec 31	Irrigation, domestic, municipal, industrial, flood control, recreational, salinity control, and fish and wildlife	Incomplete
17050	4/24/56	California Water Commission	--	Mad River	-	NE	17	1N	6E	H	500,000 af	Jan 1-Dec 31	Power	Incomplete
17291	9/21/56	Humboldt Bay Municipal Water District	--	Mad River Mad River	NW NW	NW NE	19 15	1S 6N	7E 1E	H H	20,000 af 200 cfs	Oct 1-Apr 30 Jan 1-Dec 31	Municipal	P-11715
17349	11/5/56	C. K. and June E. Ebersole	--	Tributary to Widow White Creek	SW	SW	29	7H	1E	H	0.25 cfs 2.5 af	Jan 1-Dec 31 Nov 1-May 1	Recreational, fish culture, and irrigation, 7 acres	P-10905

* P - Indicates permit number of application approved. L - Indicates license number of right confirmed. Incomplete - Indicates application not yet complete. Pending - Indicates application complete but not yet approved.
** Diversion of 10 acre-feet or more per year located by Department of Water Resources.

TABLE C-1 (Continued)

APPLICATIONS TO APPROPRIATE WATER IN MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

(Filed with State Water Rights Board as of October 1, 1960)

Application number	Date filed	Present owner	OWR** diversion location	Source	Location of point of diversion						Amount	Period of diversion	Purpose	Status*
					1/4	1/4	Sec	Tp	R	B. & M				
17510	3/14/57	Anton Liska	--	Mad River	NE	SW	27	1N	6E	H	150 gpd	Jan 1-Dec 31	Domestic	L-5829
17540	4/4/57	M. J. Vance	--	Mad River	NE	SW	27	1N	6E	H	100 gpd	Jan 1-Dec 31	Domestic	L-5814
17552	4/17/57	Charles L. McAlister, W. C. Turner, and Ernest E. Walund	--	Tributary to Mad River	SW	NW	8	4N	3E	H	1,500 gpd	Jan 1-Dec 31	Domestic	P-11381
17662	6/17/57	City of Trinidad	8N/1W-23H1	Old Mill Creek	SE SW	NE NW	23 24	8N 8N	1W 1W	H H	0.17 cfs	Jan 1-Dec 31	Municipal	P-11257
17709	7/9/57	Christian and Elsie L. Knudsen	--	Spring tributary to Mad River	SW	SW	13	6N	1E	H	10,485 gpd	Jan 1-Dec 31	Domestic and irrigation, 3 acres	P-11132
17824	9/16/57	Gino Spadoni	--	Mad River	SE	SW	2	1S	6E	H	400 gpd	Jan 1-Dec 31 Jun 15-Oct 1	Domestic Irrigation, 2 acres	L-5804
17831	9/20/57	John G. and Elva M. Brown; Allen C. and Dorothy R. Brownfield	--	Mad River	SW NW	SE NW	8 8	3S 3S	8E 8E	H H	1.58 cfs	May 15-Oct 15	Domestic, stockwatering, and irrigation, 126 acres	P-11336
17996	2/11/58	Melvin P. Roberts, Jr.	6N/2E-31H1	Mad River	Movable diversion point between NW and NE	 NE SE	 31 31	 6N 6N	 2E 2E	 H H	0.73 cfs	May 1-Oct 1	Irrigation, 120 acres	P-11511
18132	5/12/58	City of Arcata	--	Mad River Underflow	SW	NW	16	6N	1E	H	6 cfs	Jan 1-Dec 31	Municipal	P-11917
18206	7/2/58	William C. McConnaha	--	Tributary to Warren Creek	NW	SW	23	6N	1E	H	0.14 cfs	May 1-Nov 1	Irrigation, 7 acres	P-11748
18435	12/16/58	Cecil F. Hiller	--	Tributary to Strawberry Creek	NW	SE	20	7N	1E	H	15 af	Dec 1-May 1	Irrigation, 15 acres	P-11824
18646	4/15/59	James E. Grasswick	--	Mill Creek	NE	SE	23	8N	1W	H	3,500 gpd	Jan 1-Dec 31	Domestic, recreational, and fish culture	P-12112
19021	10/8/59	Arcata Redwood Company	11N/1E-27Q1	Prairie Creek	SW	SE	27	11N	1E	H	10,000 gpd	Jan 1-Dec 31	Industrial and fire protection	P-12242
19054	11/2/59	Harry Barther	--	Spring tributary to Hess Creek	NW	NE	25	8N	1W	N	0.07 cfs	Jun 1-Nov 1	Domestic and irrigation, 5 acres	P-12367
19093	11/23/59	City of Trinidad	--	McConnaha's Mill Creek	SE	SW	24	8N	1W	H	0.054 cfs	Jan 1-Dec 31	Municipal	P-12383
19181	1/12/60	Samuel J. and Mary Hendy	--	Martin Creek	NE	SW	14	8N	1W	H	3,500 gpd	Jan 1-Dec 31	Domestic and irrigation, .5 acre	P-12407
19354	4/14/60	D. C. and Charles Littlepage	--	Mill Creek	NW	SW	5	6N	1E	H	0.09 cfs	May 1-Oct 1	Irrigation, 7 acres	Pending
19452	5/26/60	Edward C. Waymire	--	Spring tributary to Smith Creek	SE	SW	6	3S	8E	H	3,500 gpd	Jan 1-Dec 31	Domestic and stockwatering	Pending
19466	6/1/60	Floyd J. and Hazel L. White	--	Hobart Creek tributary to Mad River	NW	NE	2	2S	7E	H	0.1 cfs	Jan 1-Dec 31	Domestic and irrigation, 40 acres	Pending
19504	6/24/60	Edna and Dorothy Bissell and Alice Purcell	--	Spring tributary to Mill Creek	NE	SW	5	6N	1E	H	2,000 gpd	Jan 1-Dec 31	Domestic and irrigation, 1 acre	Pending
19659	8/15/60	John G. and Elva M. Brown; Allen C. and Dorothy A. Brownfield	--	Johnson Creek	SW	SE	19	2S	8E	H	0.04 cfs	Jan 1-Dec 31	Domestic and stockwatering	Pending
19744	9/19/60	Roland S. and Eleanor B. Johnson	--	Tributary to Pacific Ocean	SW	NE	23	8N	1W	H	0.025 cfs	Jan 1-Dec 31	Domestic and irrigation, 4 acres	Pending

* P - Indicates permit number of application approved. L - Indicates license number of right confirmed. Incomplete - Indicates application not yet complete. Pending - Indicates application complete but not yet approved.

LAND A

Bul

Bulletin No.	Hydro
94-1	Tule R
94-2	Trinit
94-3	Yuba -
94-4	Smith
94-5	Shasta
94-6	Klamat
94-7	Mad Ri
94-8	Eel Ri
94-9	Lost R
94-10	Mendoc
94-11	Russia
94-12	Sacram
94-13	Putah
94-14	Americ
94-15	Sacrame
94-16	Sacrame
94-17	Feathe
94-18	Shasta

Bulletins Simil

Bulletin No.	County or
70	Orange County
71	Upper Santa An
101	Southeastern D
102	San Diego Coun
103	San Luis Obisp
24-60	Coastal Los An
121	Southern Lahon
122	Ventura County Drainage

TABLE C-1 (Continued)

APPLICATIONS TO APPROPRIATE WATER IN
MAD RIVER - REDWOOD CREEK HYDROGRAPHIC UNIT

(Filed with State Water Rights Board as of October 1, 1960)

Application number	Date filed	Present owner	DWR** diversion location	Source	Location of point of diversion						Amount	Period of diversion	Purpose	Status*
					1/4	1/4	Sec	Tp	R	B. & M.				
17510	3/14/57	Anton Liska	--	Mad River	NE	SW	27	1N	6E	H	150 gpd	Jan 1-Dec 31	Domestic	L-5829
17540	4/4/57	M. J. Vance	--	Mad River	NE	SW	27	1N	6E	H	100 gpd	Jan 1-Dec 31	Domestic	L-5814
17552	4/17/57	Charles L. McAlister, W. C. Turner, and Ernest E. Walund	--	Tributary to Mad River	SW	NW	8	4N	3E	H	1,500 gpd	Jan 1-Dec 31	Domestic	P-11381
17662	6/17/57	City of Trinidad	8N/1W-23H1	Old Mill Creek	SE SW	NE NW	23 24	8N 8N	1W 1W	H H	0.17 cfs	Jan 1-Dec 31	Municipal	P-11257
17709	7/9/57	Christian and Elsie L. Knudsen	--	Spring tributary to Mad River	SW	SW	13	6N	1E	H	10,485 gpd	Jan 1-Dec 31	Domestic and irrigation, 3 acres	P-11132
17824	9/16/57	Gino Spadoni	--	Mad River	SE	SW	2	1S	6E	H	400 gpd	Jan 1-Dec 31 Jun 15-Oct 1	Domestic Irrigation, 2 acres	L-5804
17831	9/20/57	John G. and Elva M. Brown; Allen C. and Dorothy A. Brownfield	--	Mad River	SW NW	SE NW	8 8	3S 3S	8E 8E	H H	1.58 cfs	May 15-Oct 15	Domestic, stockwatering, and irrigation, 126 acres	P-11336
17996	2/11/58	Melvin P. Roberts, Jr.	6N/2E-31H1	Mad River	Movable diversion point between NW	NE	31	6N	2E	H	0.73 cfs	May 1-Oct 1	Irrigation, 120 acres	P-11511
					NE	SE	and 31	6N	2E	H				
18132	5/12/58	City of Arcata	--	Mad River Underflow	SW	NW	16	6N	1E	H	6 cfs	Jan 1-Dec 31	Municipal	P-11917
18206	7/2/58	William C. McConnaha	--	Tributary to Warren Creek	NW	SW	23	6N	1E	H	0.14 cfs	May 1-Nov 1	Irrigation, 7 acres	P-11748
18435	12/16/58	Cecil F. Miller	--	Tributary to Strawberry Creek	NW	SE	20	7N	1E	H	15 af	Dec 1-May 1	Irrigation, 15 acres	P-11824
18646	4/15/59	James E. Grasswick	--	Mill Creek	NE	SE	23	8N	1W	H	3,500 gpd	Jan 1-Dec 31	Domestic, recreational, and fish culture	P-12112
19021	10/8/59	Arcata Redwood Company	11N/1E-27Q1	**Prairie Creek**	SW	SE	27	11N	1E	H	10,000 gpd	Jan 1-Dec 31	Industrial and fire protection	P-12242
19054	11/2/59	Harry Barther	--	Spring tributary to Hess Creek	NW	NE	25	8N	1W	H	0.07 cfs	Jun 1-Nov 1	Domestic and irrigation, 5 acres	P-12367
19093	11/23/59	City of Trinidad	--	McConnaha's Mill Creek	SE	SW	24	8N	1W	H	0.054 cfs	Jan 1-Dec 31	Municipal	P-12383
19181	1/12/60	Samuel J. and Mary Hendy	--	Martin Creek	NE	SW	14	8N	1W	H	3,500 gpd	Jan 1-Dec 31	Domestic and irrigation, .5 acre	P-12407
19354	4/14/60	D. C. and Charles Littlepage	--	Mill Creek	NW	SW	5	6N	1E	H	0.09 cfs	May 1-Oct 1	Irrigation, 7 acres	Pending
19452	5/26/60	Edward C. Waymire	--	Spring tributary to Smith Creek	SE	SW	6	3S	8E	H	3,500 gpd	Jan 1-Dec 31	Domestic and stockwatering	Pending
19466	6/1/60	Floyd J. and Hazel L. White	--	Hobart Creek tributary to Mad River	NW	NE	2	2S	7E	H	0.1 cfs	Jan 1-Dec 31	Domestic and irrigation, 40 acres	Pending
19504	6/24/60	Edna and Dorothy Bissell and Alice Purcell	--	Spring tributary to Mill Creek	NE	SW	5	6N	1E	H	2,000 gpd	Jan 1-Dec 31	Domestic and irrigation, 1 acre	Pending
19659	8/15/60	John G. and Elva M. Brown; Allen C. and Dorothy A. Brownfield	--	Johnson Creek	SW	SE	19	2S	8E	H	0.04 cfs	Jan 1-Dec 31	Domestic and stockwatering	Pending
19744	9/19/60	Roland S. and Eleanor B. Johnson	--	Tributary to Pacific Ocean	SW	NE	23	8N	1W	H	0.025 cfs	Jan 1-Dec 31	Domestic and irrigation, 4 acres	Pending

* P - Indicates permit number of application approved. L - Indicates license number of right confirmed. Incomplete - Indicates application not yet complete. Pending - Indicates application complete but not yet approved.

LAND AND WATER USE BULLETINS

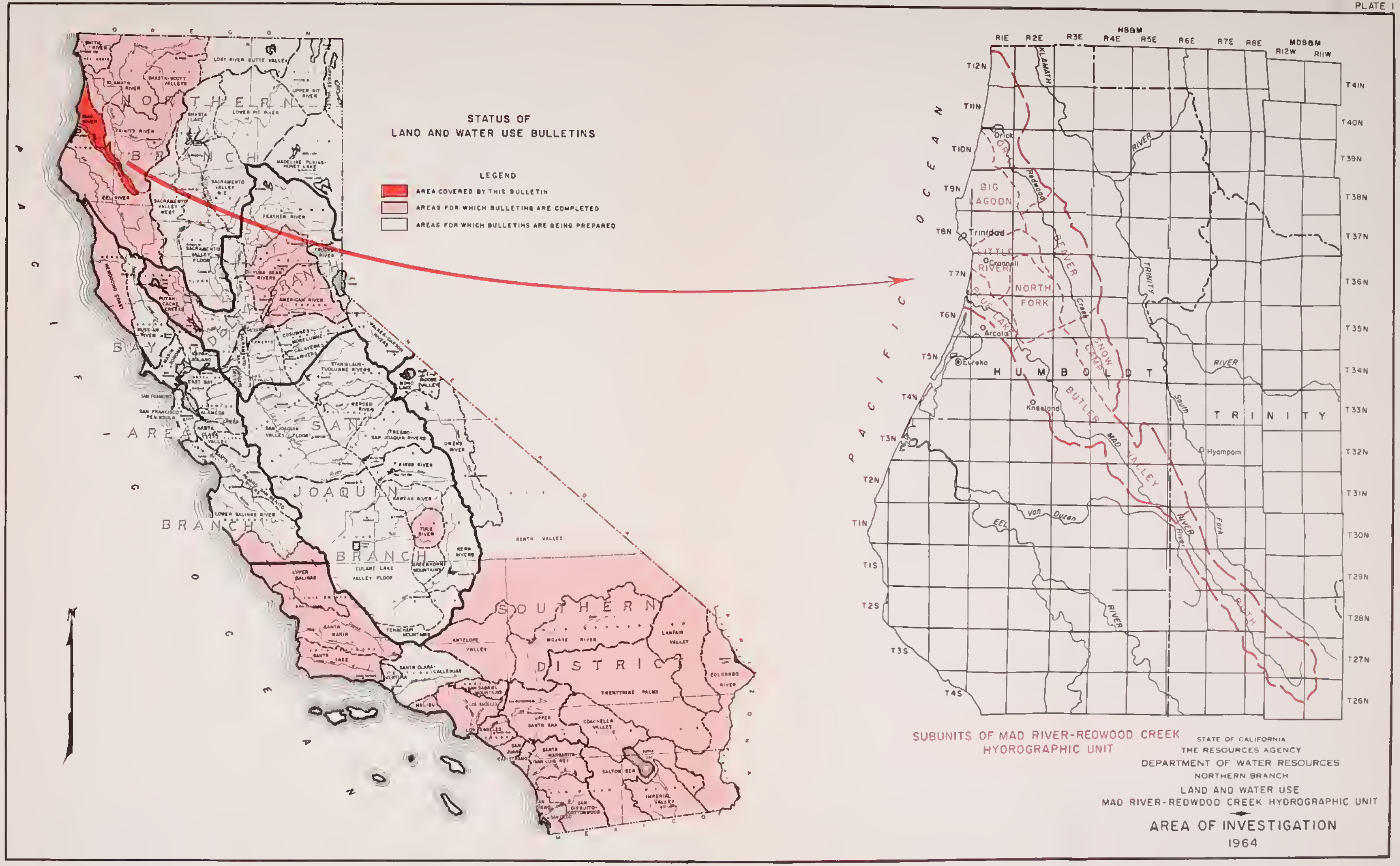
Bulletin No. 94 Series

Bulletin No.	Hydrographic Unit Covered	Year of Survey
94-1	Tule River	1957
94-2	Trinity River	1957
94-3	Yuba - Bear Rivers	1957-58
94-4	Smith River	1958
94-5	Shasta - Scott Valleys	1958
94-6	Klamath River	1958
94-7	Mad River - Redwood Creek	1958
94-8	Eel River	1958-59
94-9	Lost River - Butte Valley	1959
94-10	Mendocino Coast	1959
94-11	Russian River	1959
94-12	Sacramento Valley West	1959
94-13	Putah - Cache Creeks	1960
94-14	American River	1960
94-15	Sacramento Valley Floor	1961
94-16	Sacramento Valley Northeast	1962
94-17	Feather River	1962-63
94-18	Shasta Lake	1963

Bulletins Similar to the Bulletin 94 Series

Bulletin No.	County or Drainage Area Covered	Year of Survey
70	Orange County	1964
71	Upper Santa Ana River Drainage	1964
101	Southeastern Desert Areas	1958
102	San Diego County	1963
103	San Luis Obispo and Santa Barbara Counties	1959
24-60	Coastal Los Angeles County	1960
121	Southern Lahontan Area	1961
122	Ventura County and Upper Santa Clara River Drainage	1961

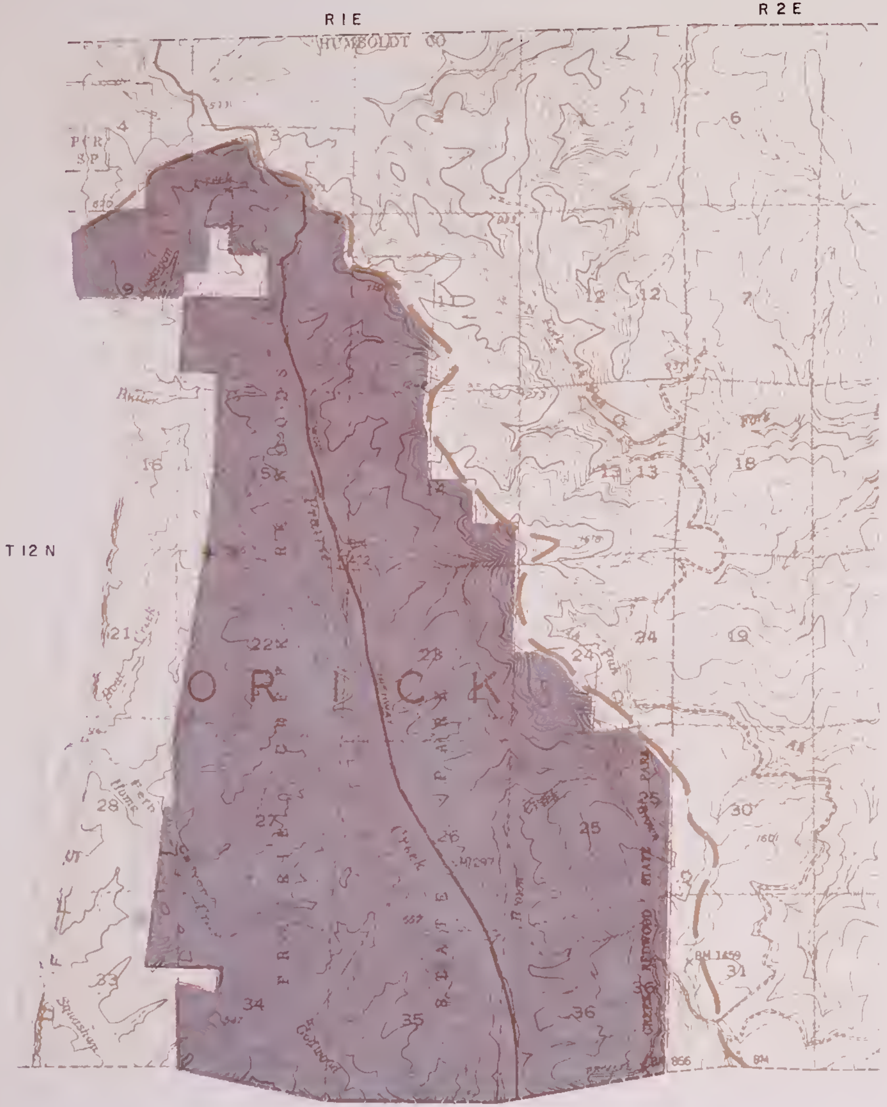
PLATE 1

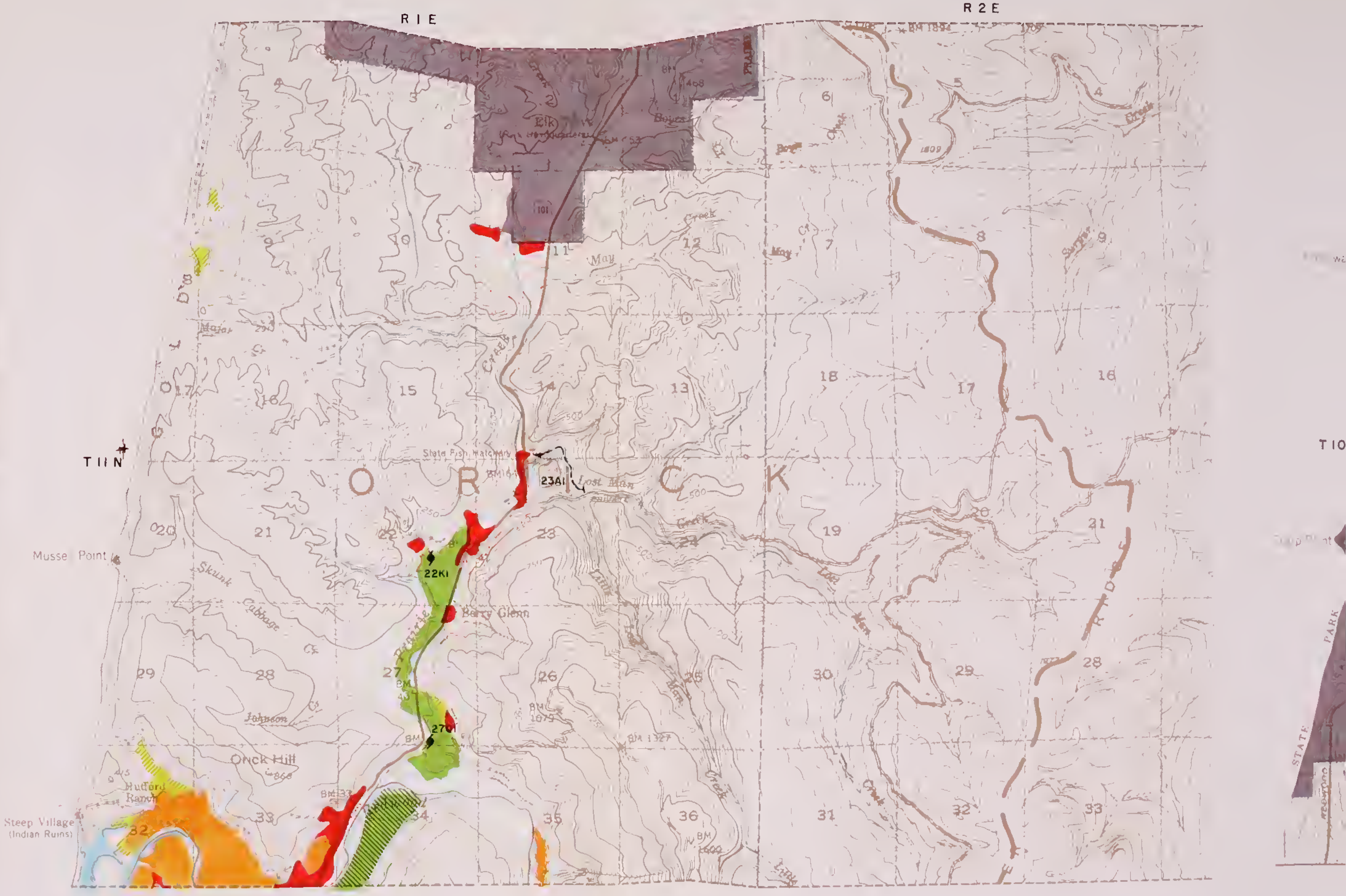


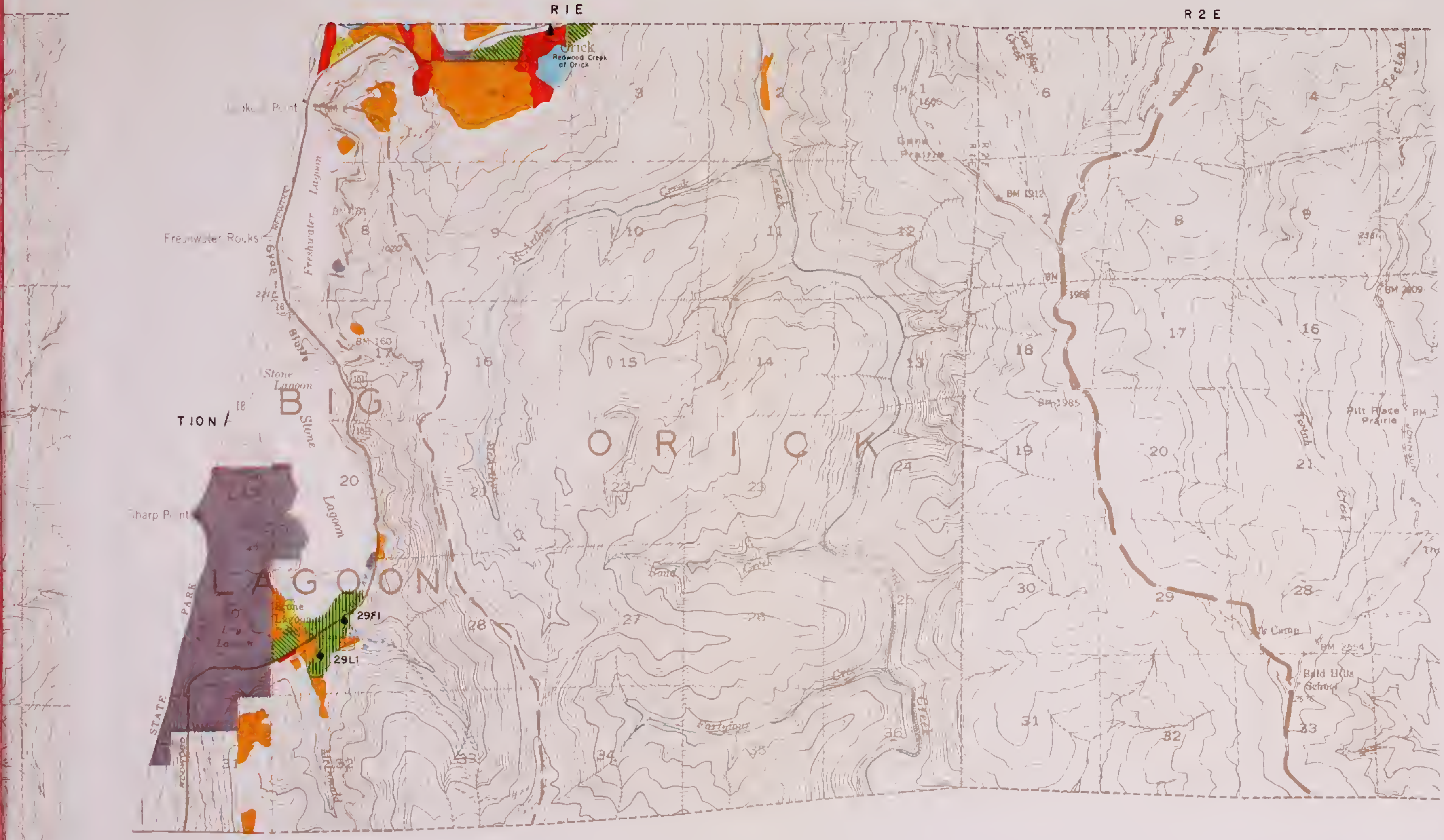
SUBUNITS OF MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

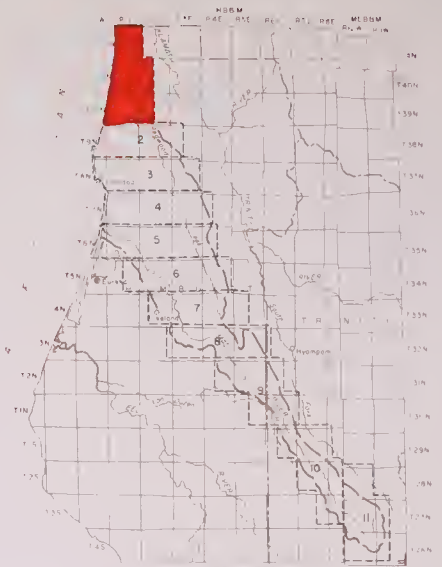
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

AREA OF INVESTIGATION
1964


R I E
R 2 E
HUMBOLDT CO
T 12 N
O R I C K
PRAIRIE CREEK REDWOODS STATE PARK
Prairie Creek
Fern Canyon
Squashan
Butler
Home
Gold
12
13
18
24
25
30
34
35
36
31


R I E
R 2 E
T 11 N
T 10
O R I C K
Elk Prairie
Musse Point
State Fish Hatchery
Lost Man
Boyes
Major
Skunk Cabbage
Johnson
Orick Hill
Berry Glenn
Bufford Ranch
Steep Village (Indian Ruins)
Little Lost Man
May
Creek
22K1
23A1
27C1
15
16
13
14
18
17
21
23
26
28
29
32
33
35
36
31





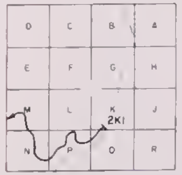
INDEX TO SHEETS

2K1 — GRAVITY DIVERSION
29F1 ● — PUMP DIVERSION
DIVERSION CANAL OR DITCH
DIVERSION PIPE
▼ STREAM GAGING STATION
HYDROGRAPHIC UNIT BOUNDARY
SUBUNIT BOUNDARY

LEGEND

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
▨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
🟪	RECREATIONAL LANDS
▨	LANDS IRRIGATED BY GROUND WATER
▥	LANDS IRRIGATED BY GROUND WATER AND SURFACE WATER
⁘	MARSH OR SWAMP

KEY TO NUMBERING SYSTEM



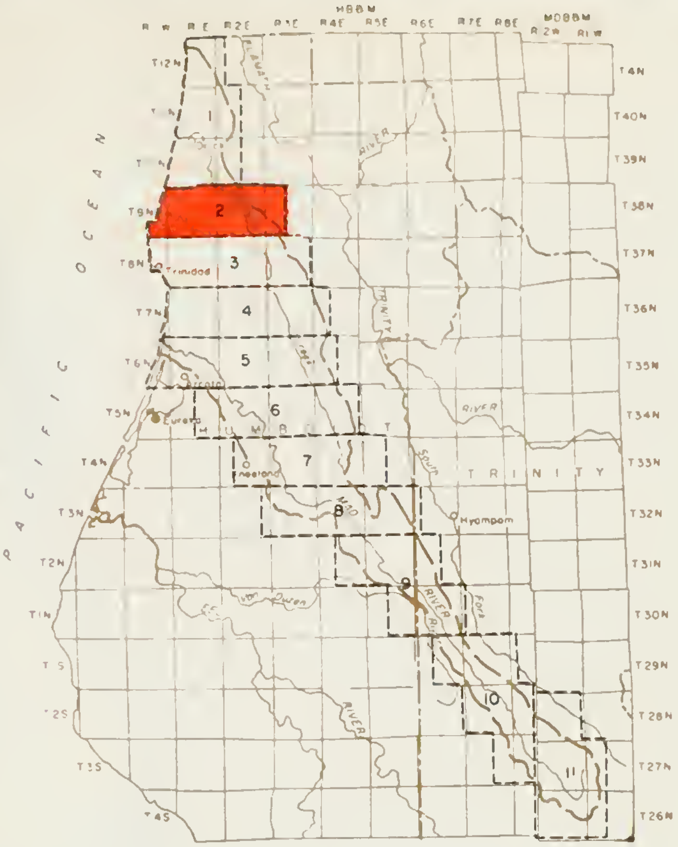
DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISON OF SECTION, eg DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE

T10-12N, R1W-2E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



INDEX TO SHEETS

LEGEND

GRAVITY DIVERSION

PUMP DIVERSION

DIVERSION CANAL OR DITCH

DIVERSION PIPE

STREAM GAGING STATION

HYDROGRAPHIC UNIT BOUNDARY

SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
▨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
🟪	RECREATIONAL LANDS
▲	MARSH OR SWAMP

SYSTEM

A

H

J

R

BERED BY
VISON OF
7E-2K1

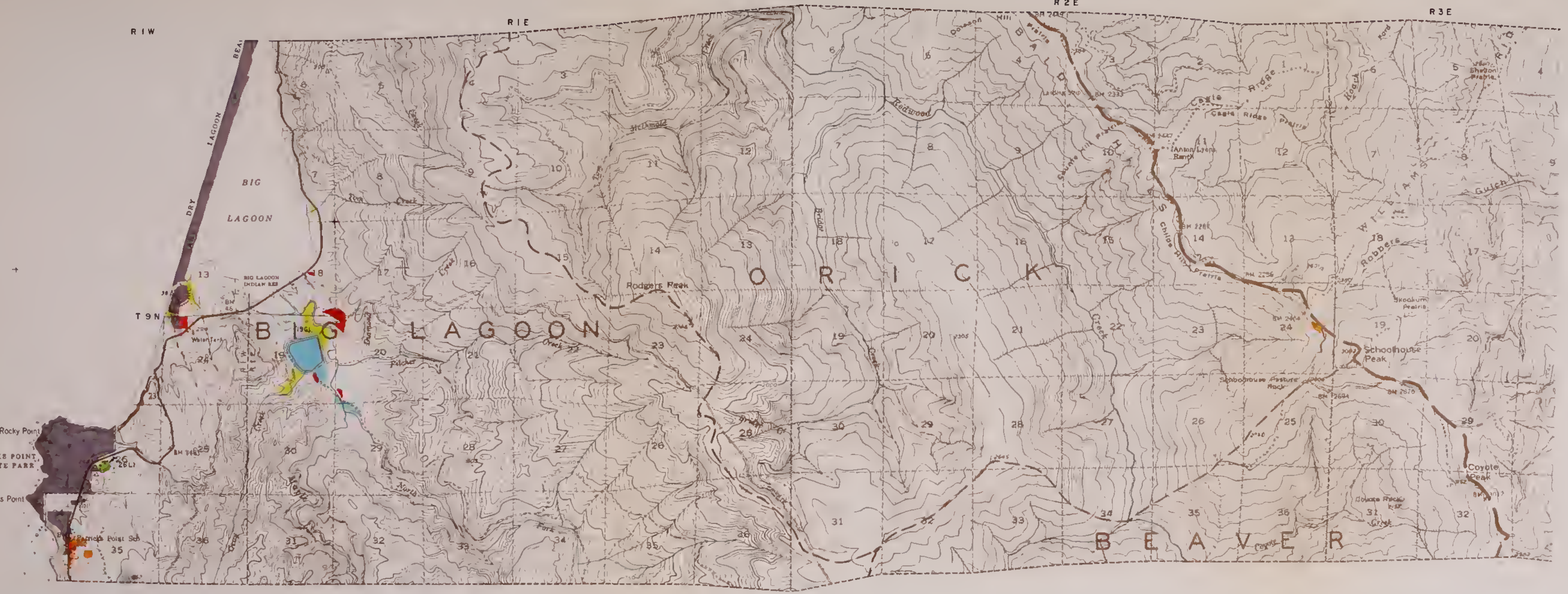
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

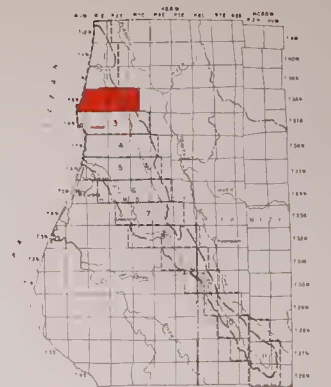
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE

T 9 N, R1W-3E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



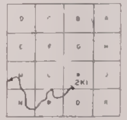

INDEX TO SHEETS

LEGEND

- GRAVITY DIVERSION
- PUMP DIVERSION
- DIVERSION CANAL OR DITCH
- DIVERSION PIPE
- STREAM GAGING STATION
- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
▨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
⬛	RECREATIONAL LANDS
☐	MARSH OR SWAMP

KEY TO NUMBERING SYSTEM

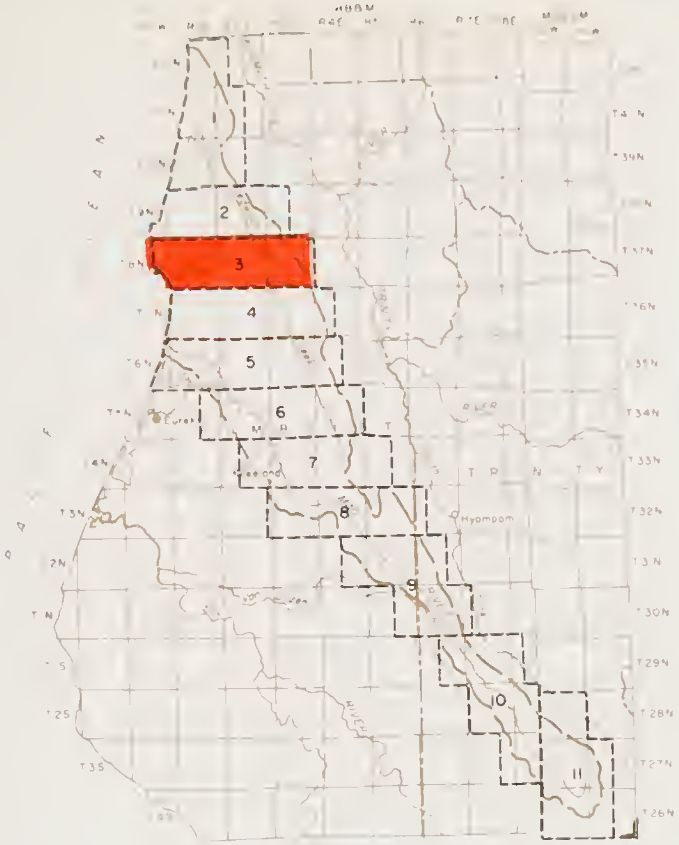


DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP RANGE AND SUBDIVISION OF SECTION, eg DIVERSION 25:FE 2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 9 N, R1W-3E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



INDEX TO SHEETS

LEGEND

GRAVITY DIVERSION

PUMP DIVERSION

DIVERSION CANAL OR DITCH

DIVERSION PIPE

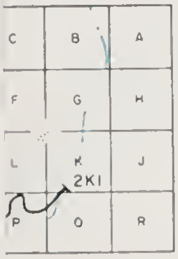
STREAM GAGING STATION

HYDROGRAPHIC UNIT BOUNDARY

SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
⬛	RECREATIONAL LANDS
▨	LANDS IRRIGATED BY GROUND WATER

IUMBERING SYSTEM



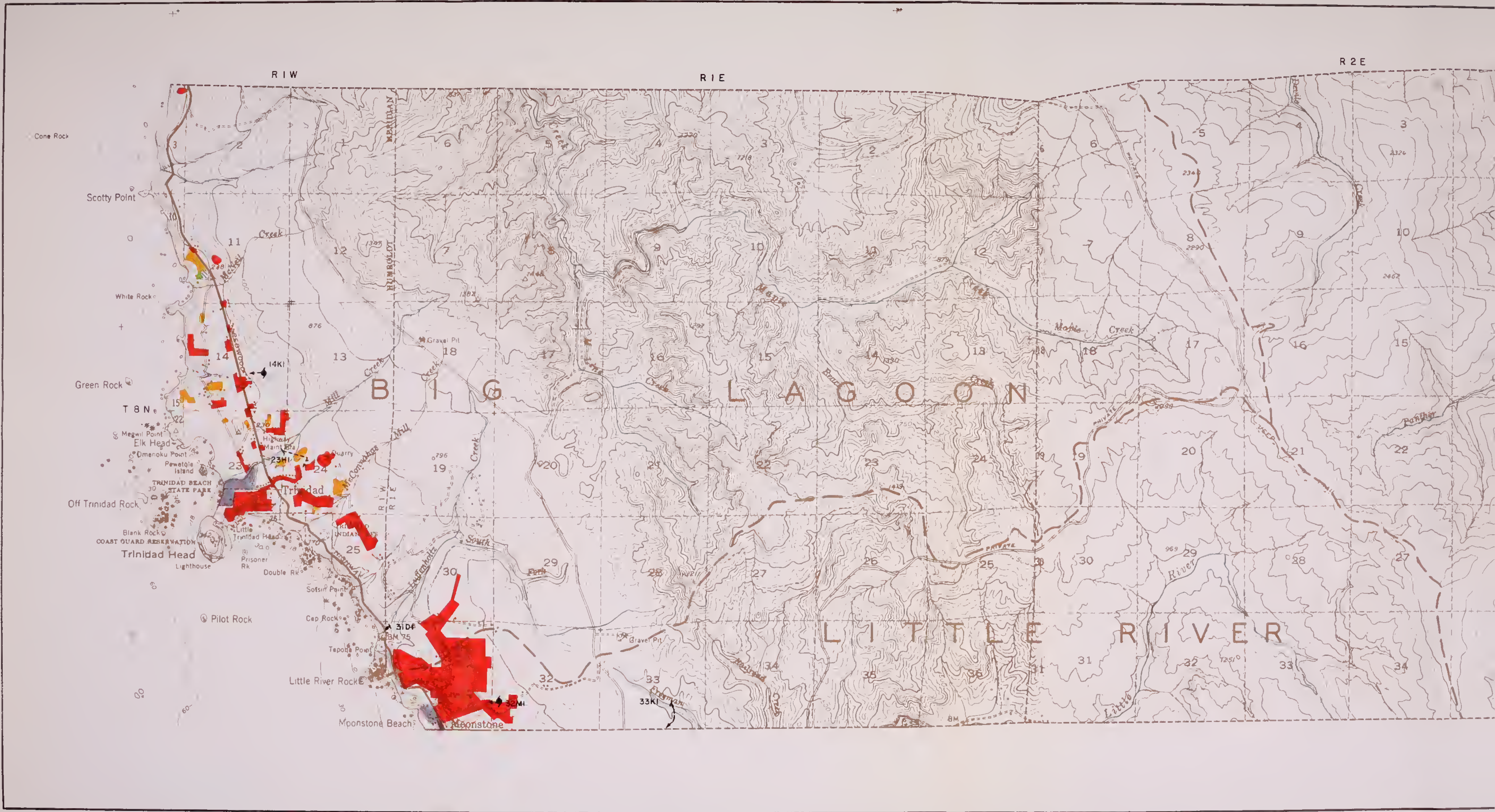
HOWN ARE NUMBERED BY
NGE AND SUBDIVISON OF
IIVERSION 2S/7E-2K1

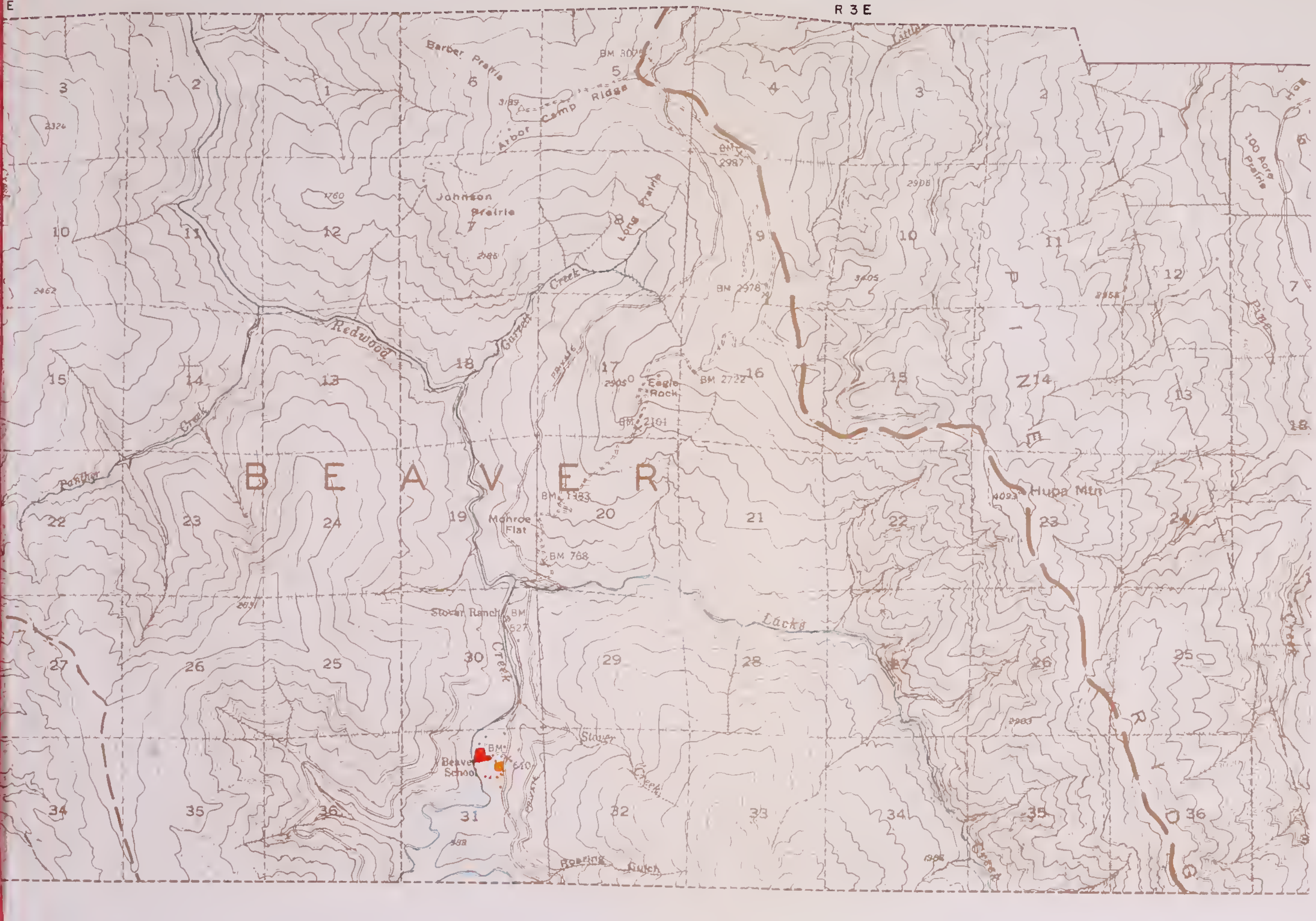
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

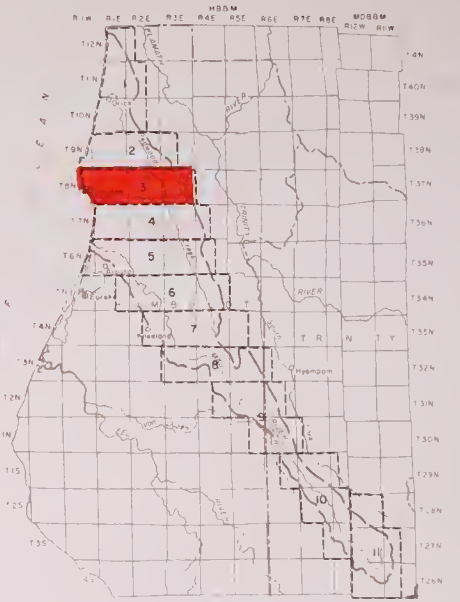
LAND AND WATER USE

T 8 N, R1W-3E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R1W
R1E
R2E
T 8 N
BIG LAGOON
LITTLE RIVER
Cone Rock
Scotty Point
White Rock
Green Rock
Megwil Point
Elk Head
Omenoku Point
Pewetole Island
TRINIDAD BEACH STATE PARK
Off Trinidad Rock
Trinidad
Blank Rock
COAST GUARD RESERVATION
Trinidad Head
Lighthouse
Little Trinidad Head
Prisoner Rk
Double Rk
Sotsin Point
Pilot Rock
Cap Rock
Tepona Point
Little River Rock
Moonstone Beach
Moonstone
Highway Maint Sta
Quarry
Gravel Pit
HUMBOLDT MERIDIAN
Mill Creek
McConahay Mill
Maple Creek
Creek
South Fork
Little River
PRIVATE
14K1
23H1
31D1
32M1
33K1
BM 75
8M





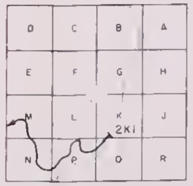
INDEX TO SHEETS

	GRAVITY DIVERSION
	PUMP DIVERSION
	DIVERSION CANAL OR DITCH
	DIVERSION PIPE
	STREAM GAGING STATION
	HYDROGRAPHIC UNIT BOUNDARY
	SUBUNIT BOUNDARY

LEGEND

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
■	RECREATIONAL LANDS
▨	LANDS IRRIGATED BY GROUND WATER

KEY TO NUMBERING SYSTEM

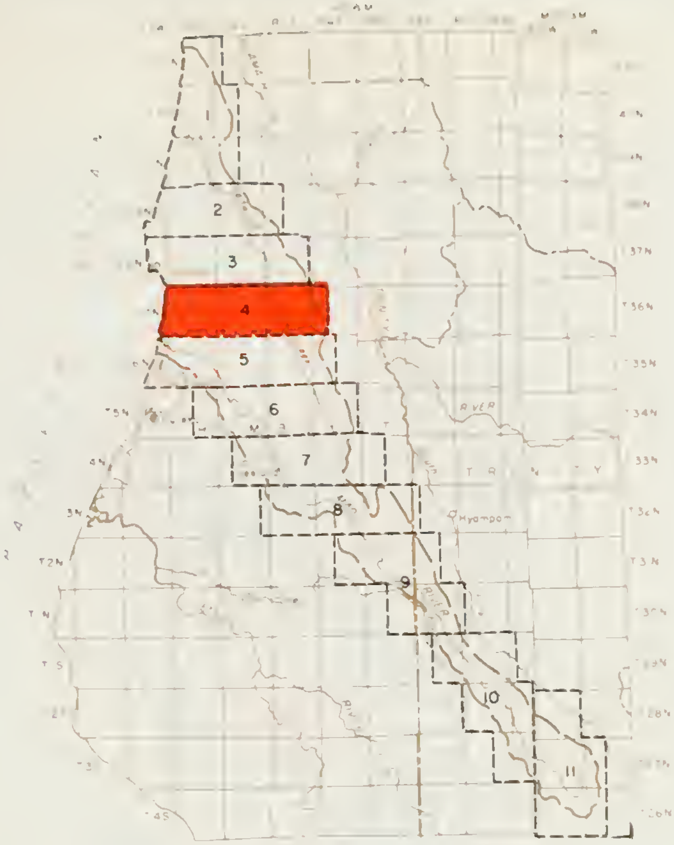


DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISON OF SECTION, eg DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 8 N, R1W-3E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



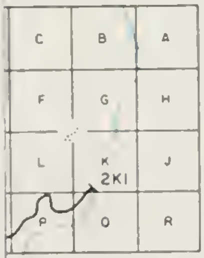
INDEX TO SHEETS

LEGEND

GRAVITY DIVERSION
PUMP DIVERSION
DIVERSION CANAL OR DITCH
DIVERSION PIPE
STREAM GAGING STATION
HYDROGRAPHIC UNIT BOUNDARY
SUBUNIT BOUNDARY

🟩 LANDS RECEIVING FULL IRRIGATION
🟩 LANDS RECEIVING PARTIAL IRRIGATION
🟨 LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
🟨 NATURALLY IRRIGATED MEADOWLANDS
🟧 DRY FARMED LANDS
🟥 URBAN LANDS
🟪 RECREATIONAL LANDS
▨ LANDS IRRIGATED BY GROUND WATER

NUMBERING SYSTEM



S SHOWN ARE NUMBERED BY
RANGE AND SUBDIVISON OF
g DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

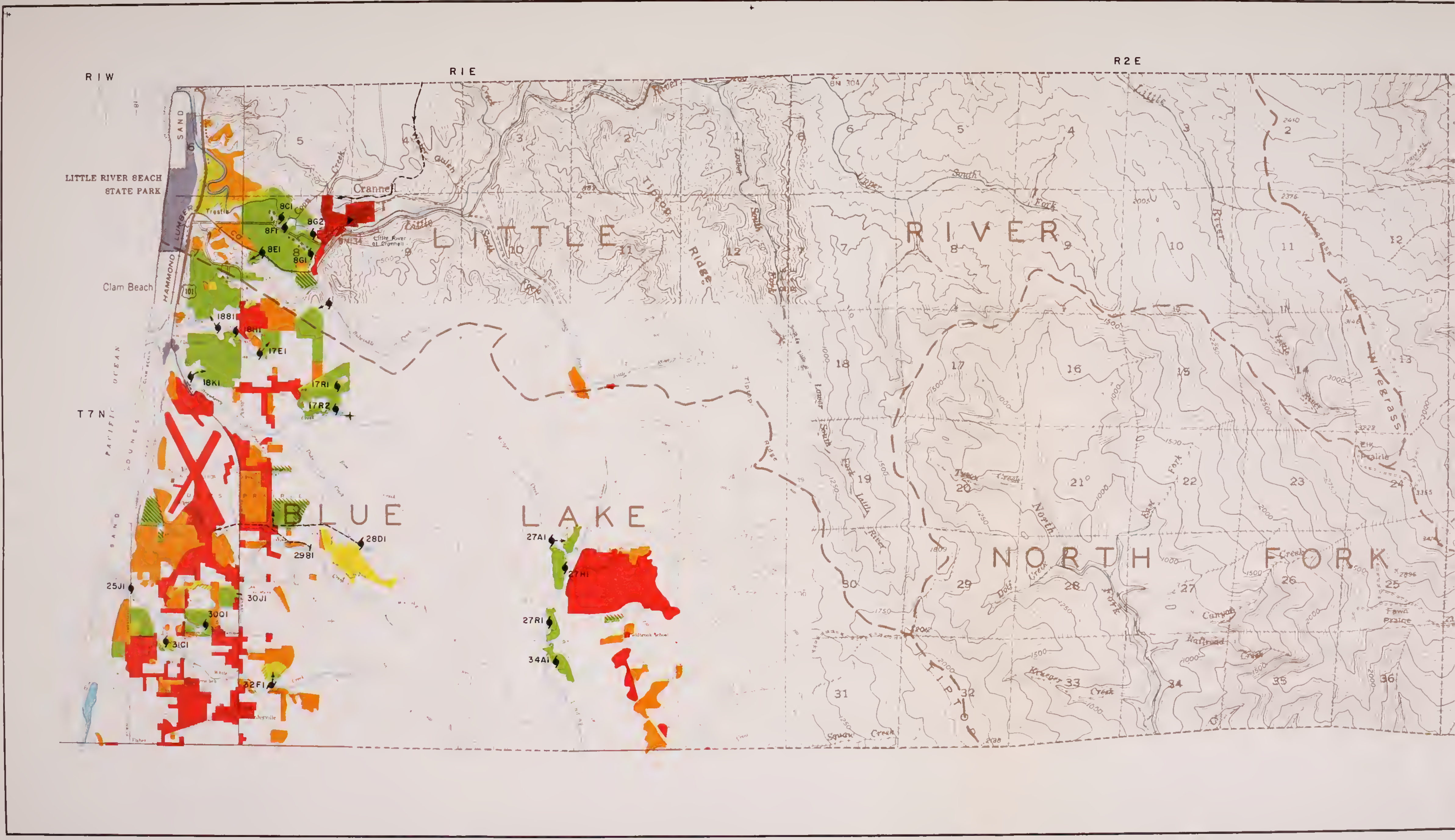
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

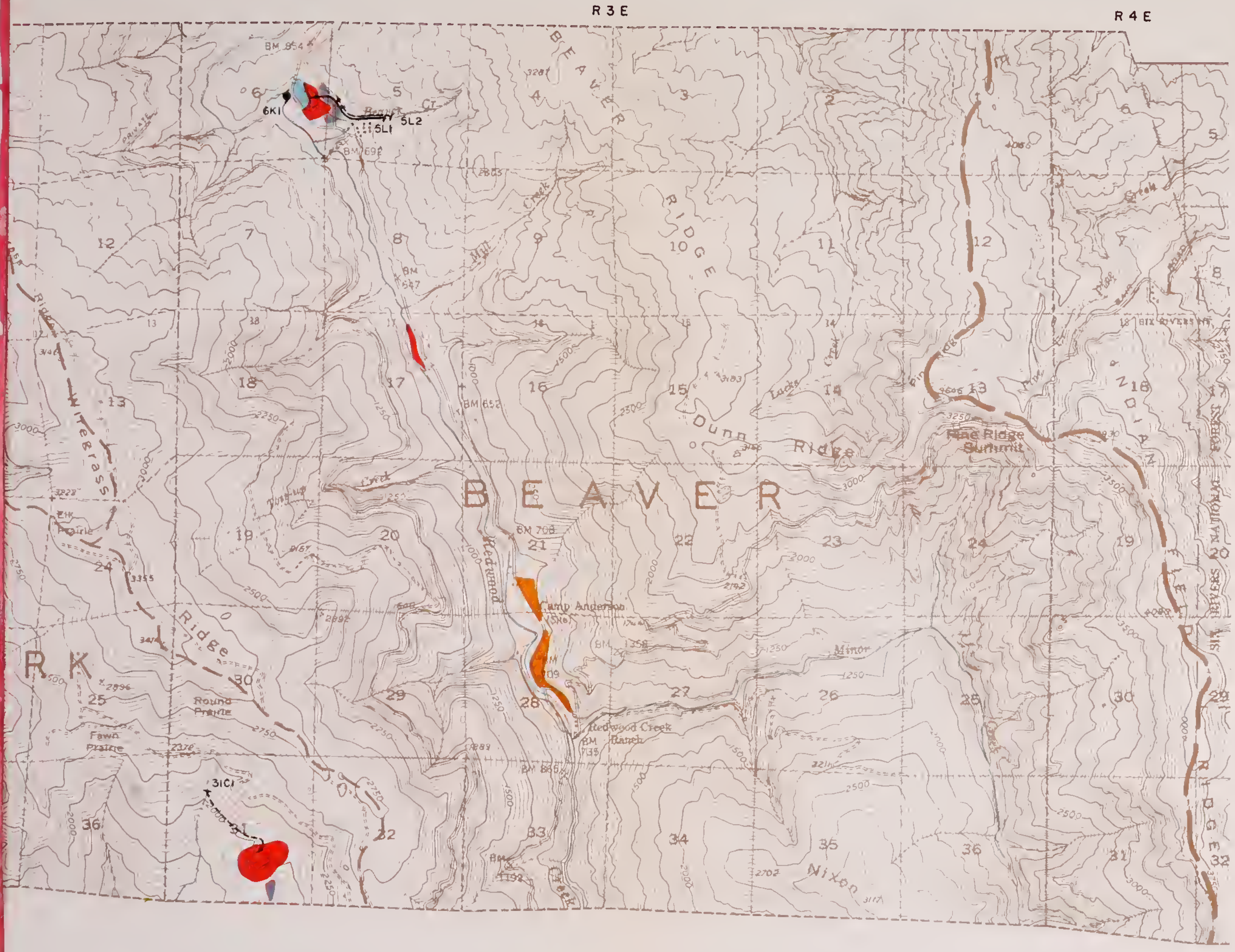
◆

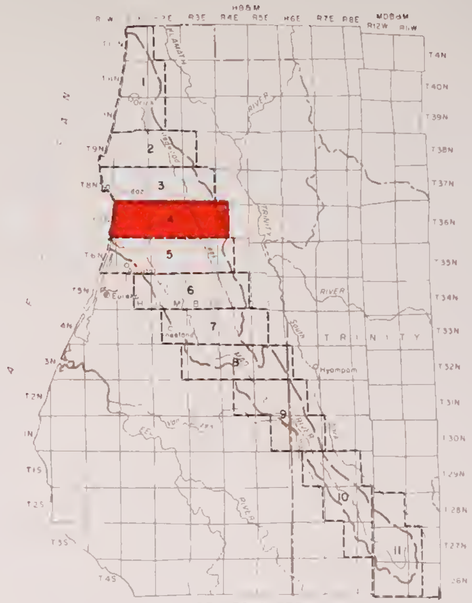
LAND AND WATER USE

T 7 N, R1W-4E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R1W
R1E
R2E
T7N
LITTLE RIVER BEACH STATE PARK
Clam Beach
SAND
HAMMOND LUMBER CO
Trestle
101
PACIFIC OCEAN
SAND DUNES
Crannell
Little River at Crannell
LITTLE RIVER
BLUE LAKE
NORTH FORK
Tip Top Ridge
Lower South Fork Little River
South Fork
Upper South Fork
Kruger Creek
Squaw Creek
Canyon Creek
Railroad Creek
8C1
8G2
8F1
8E1
8G1
18B1
18H1
17E1
18K1
17R1
17R2
28D1
29B1
25J1
30J1
30Q1
31C1
32F1
27A1
27H1
27R1
34A1





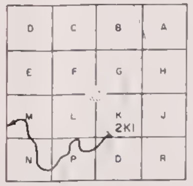
INDEX TO SHEETS

- GRAVITY DIVERSION
- ● PUMP DIVERSION
- DIVERSION CANAL OR DITCH
- DIVERSION PIPE
- ▼ STREAM GAGING STATION
- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY

LEGEND

- 🟩 LANDS RECEIVING FULL IRRIGATION
- 🟩 LANDS RECEIVING PARTIAL IRRIGATION
- 🟨 LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
- 🟨 NATURALLY IRRIGATED MEADOWLANDS
- 🟧 DRY FARMED LANDS
- 🟥 URBAN LANDS
- 🟪 RECREATIONAL LANDS
- ▨ LANDS IRRIGATED BY GROUND WATER

KEY TO NUMBERING SYSTEM



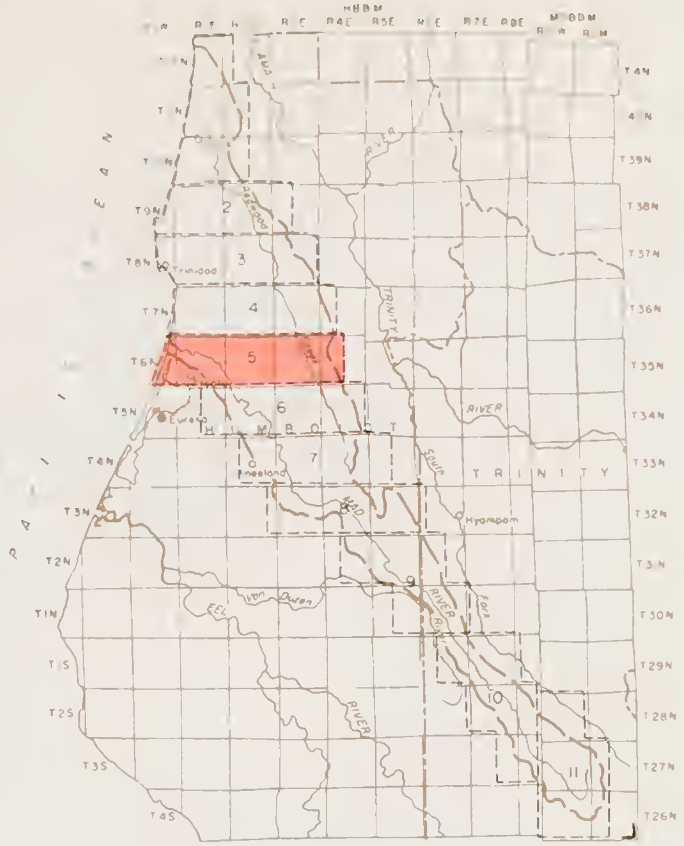
DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISON OF SECTION, eg DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 7 N, R1W-4E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



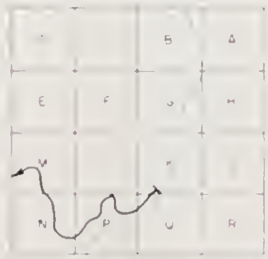
INDEX TO SHEETS

LEGEND

↗	GRAVITY DIVERSION
●	PUMP DIVERSION
→	DIVERSION CANAL OR DITCH
⇢	DIVERSION PIPE
▼	STREAM GAGING STATION
〰	HYDROGRAPHIC UNIT BOUNDARY
∼	SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
🟨	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
🟨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
☐	URBAN LANDS
🟪	RECREATIONAL LANDS
⬚	LANDS IRRIGATED BY GROUND WATER
☐	MARSH OR SWAMP

KEY TO NUMBERING SYSTEM



DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISION OF SECTION eg DIVERSION [illegible]

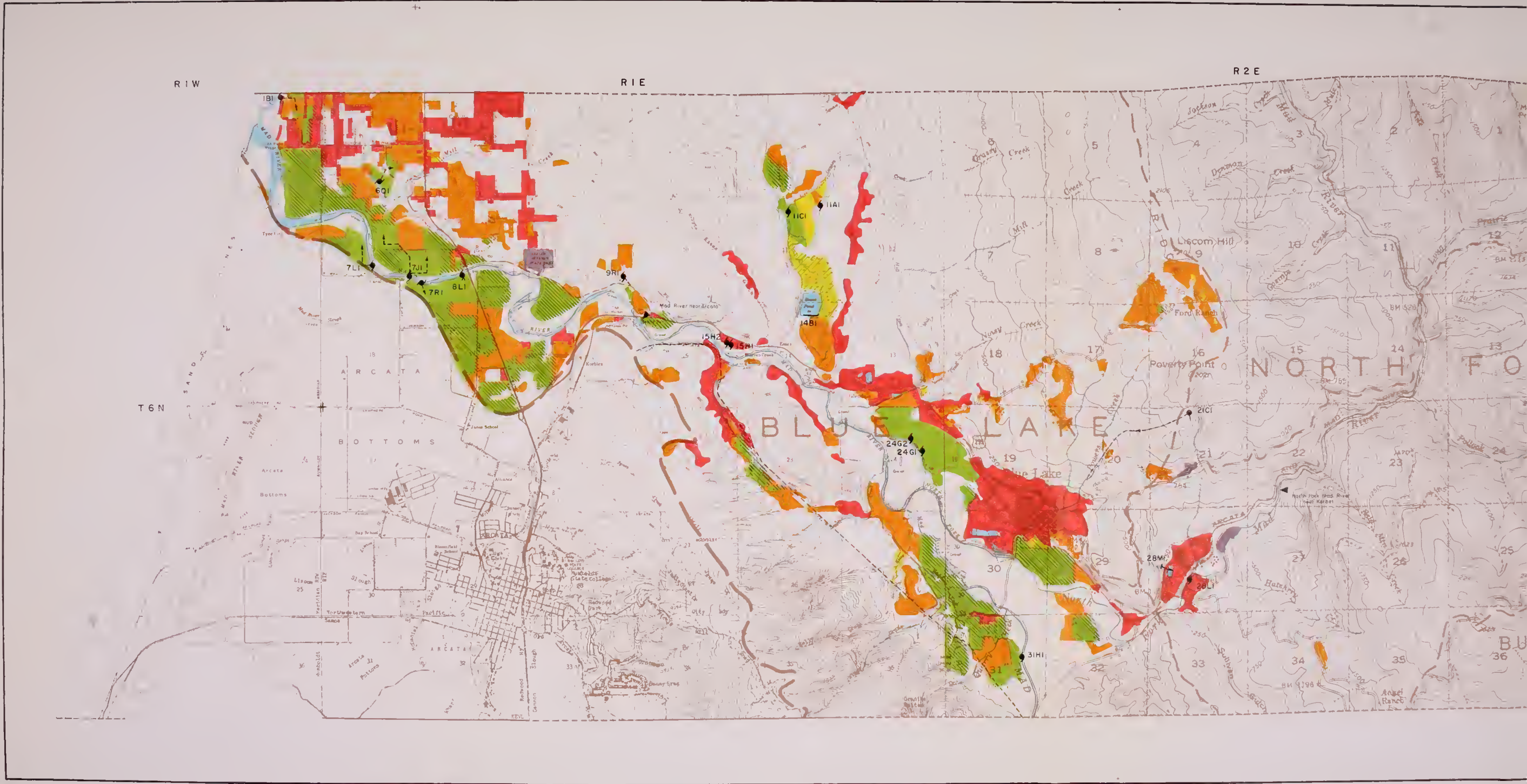
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

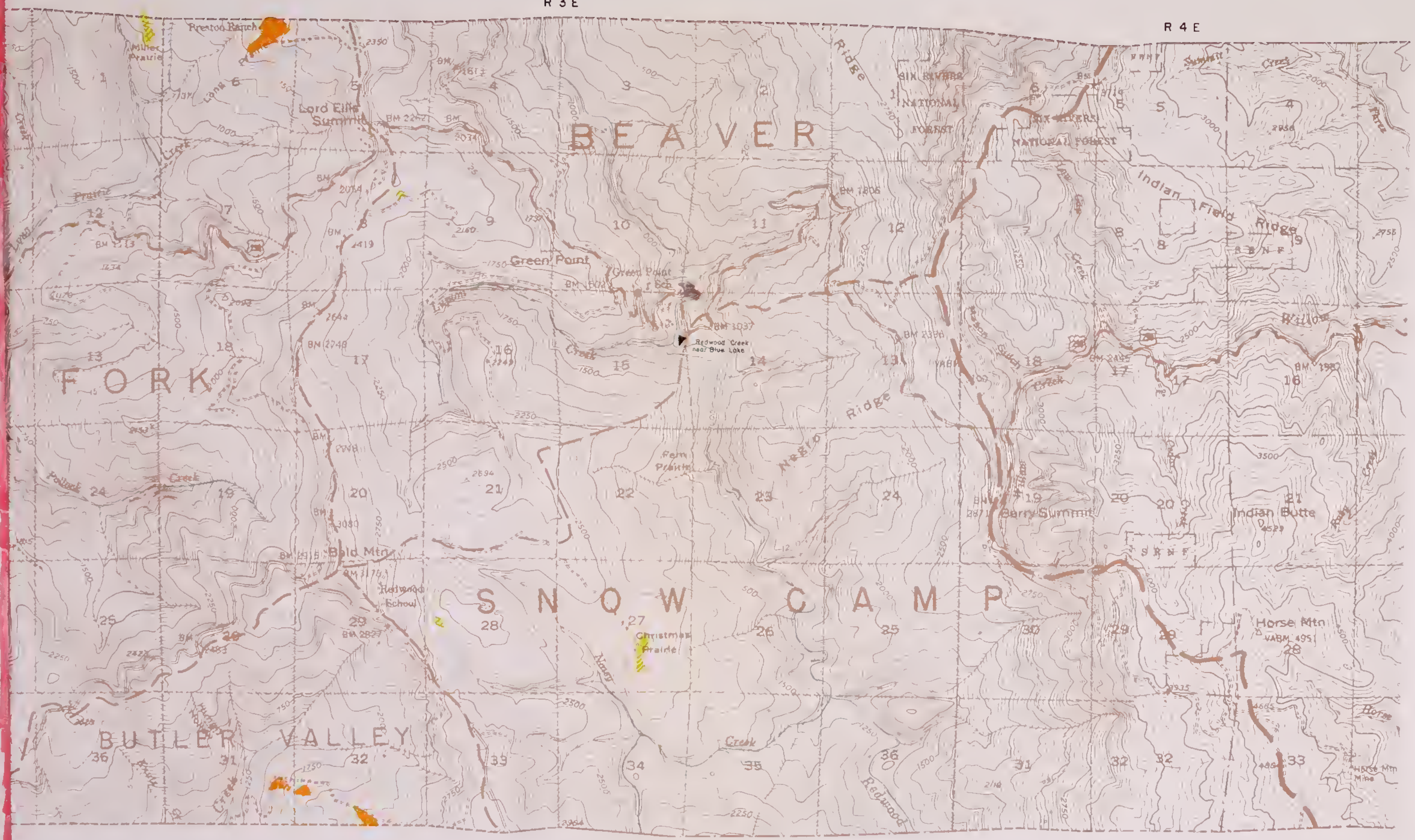
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

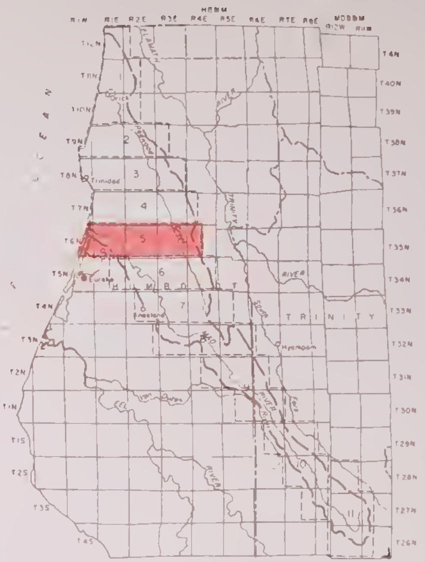
◆

LAND AND WATER USE
T 6 N, R1W-4E HB&M
1958

SCALE IN FEET


R1W
R1E
R2E
T6N
1B1
6Q1
7L1
7J1
7R1
8L1
9R1
Mad River near Arcata
15H2
15B1
11C1
11A1
14B1
24G2
24G1
21C1
28M1
28L1
31H1
ARCATA
BOTTOMS
BLUE LAKE
NORTH FO
Liscom Hill
Ford Ranch
Poverty Point
Blue Lake
MAD RIVER
North Fork Mad River near Korbel
Arcata
Jackson
Dyerman Creek
Grassy Creek
Mill Creek
Powers Creek
Hatchery
Pollock
Angel Ranch
BU
1
2
3
4
5
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
29
30
31
32
33
34
35
36



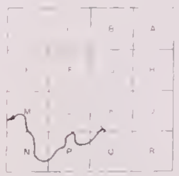

INDEX TO SHEETS

LEGEND

↙	[illegible]
◆	PUMP LOCATION
〰	[illegible] CANAL
⇢	[illegible]
▼	STREAM GAGING STATION
〰	HYDROGRAPHIC UNIT BOUNDARY
〰	SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
🟨	LANDS USUALLY IRRIGATED BUT [illegible]
▨	NATURALLY SUBIRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
	URBAN LANDS
🟪	RECREATIONAL LANDS
	[illegible] IRRIGATED BY [illegible]
	[illegible]

KEY TO NUMBERING SYSTEM

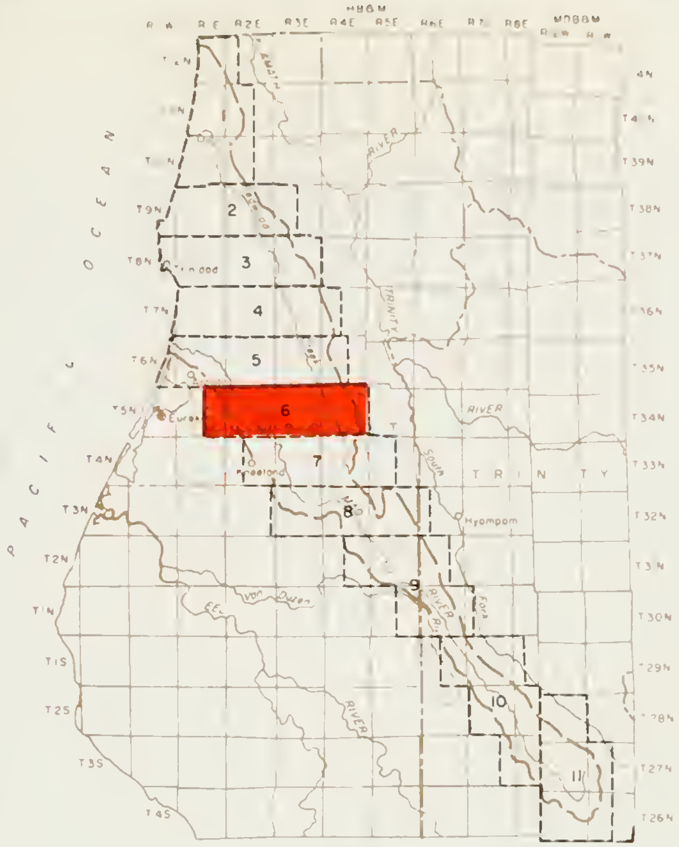


DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISION OF SECTION, eg DIVERSION [illegible]

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 6 N, R 1 W - 4 E H B & M
1958



INDEX TO SHEETS

LEGEND

⌒	GRAVITY DIVERSION
●	PUMP DIVERSION
⌒	DIVERSION CANAL OR DITCH
- - -	DIVERSION PIPE
▼	STREAM GAGING STATION
∼	HYDROGRAPHIC UNIT BOUNDARY
∼	SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
🟨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
NONE	URBAN LANDS
🟫	RECREATIONAL LANDS
▨	LANDS IRRIGATED BY GROUND WATER

RING SYSTEM

B	A
G	H
K	J
O	R

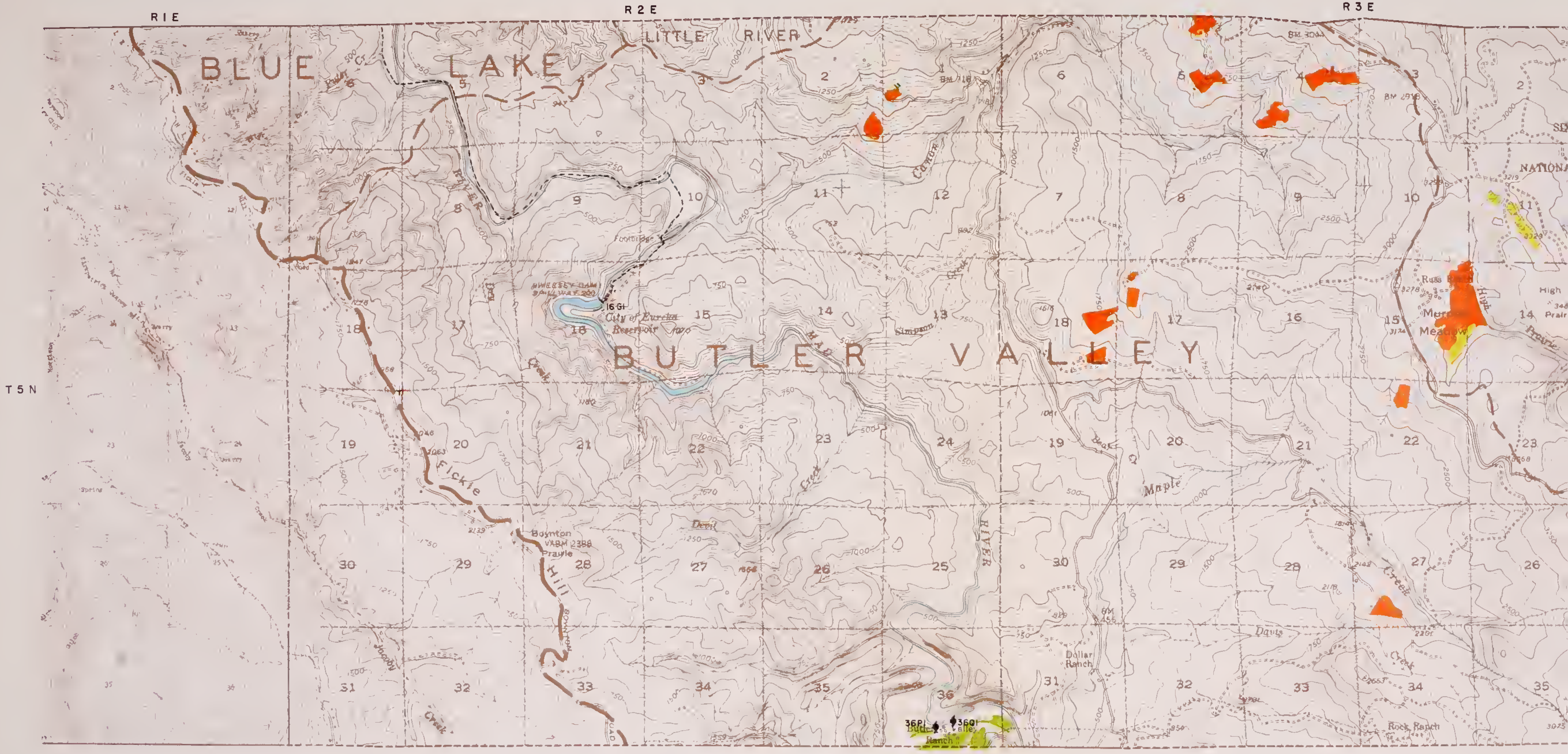
ARE NUMBERED BY
D SUBDIVISON OF
N 2S/7E-2K1

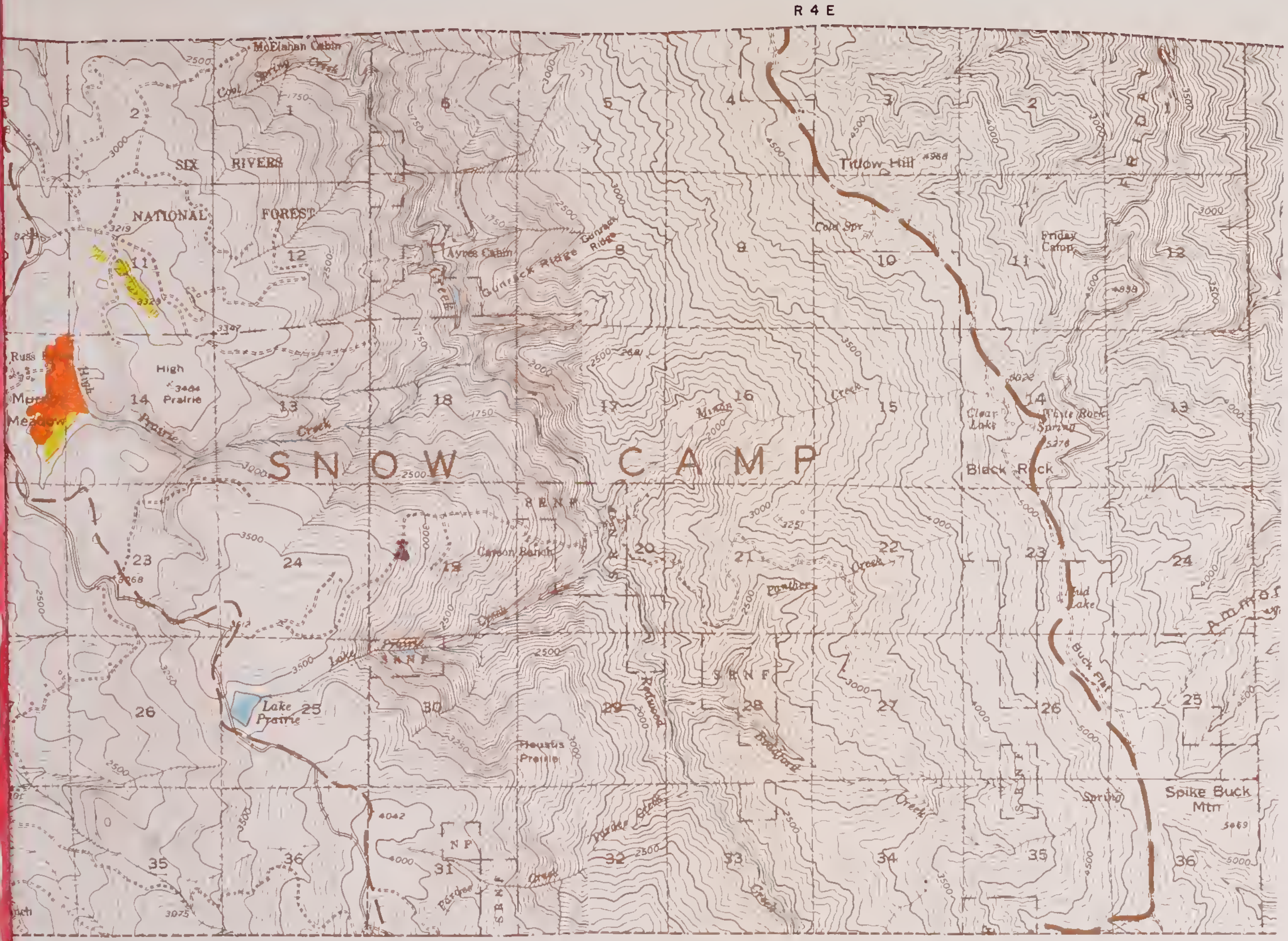
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

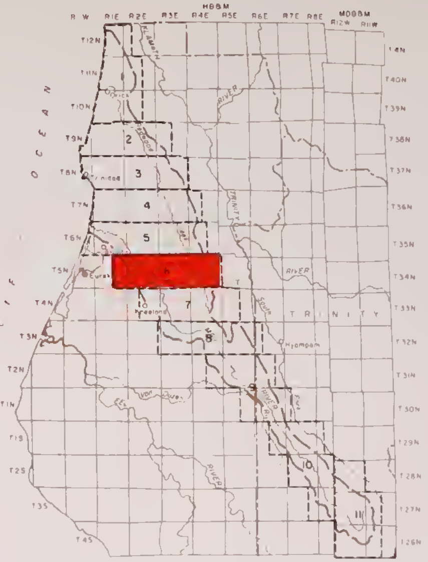
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 5 N, R 1-4 E HB&M
1958

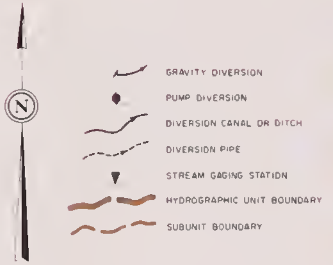
SCALE OF FEET
2000 0 2000 4000 6000


R1E
R2E
R3E
T5N
BLUE LAKE
LITTLE RIVER
BUTLER VALLEY
City of Eureka Reservoir
SWEASEY DAM
16G1
Fickle Hill
Boynton Prairie
VABM 2388
Mad River
Canon Creek
Simpson
Maple Creek
Davis Creek
Devil Creek
Dollar Ranch
Butler Valley Ranch
36P1
36Q1
Rock Ranch
Russ
Murphy Meadow
High Prairie
NATIONAL
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36




HB&M
R W R1E R2E R3E R4E R5E R6E R7E R8E
MDB&M R12W R11W
T12N T11N T10N T9N T8N T7N T6N T5N T4N T3N T2N T1N T1S T2S T3S T4S
T41N T40N T39N T38N T37N T36N T35N T34N T33N T32N T31N T30N T29N T28N T27N T26N
PACIFIC OCEAN
TRINITY
RIVER
2 3 4 5 6 7 8 9 10 11

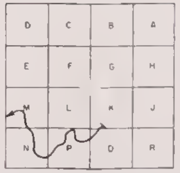
INDEX TO SHEETS



LEGEND

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
🟨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
NONE	URBAN LANDS
🟥	RECREATIONAL LANDS
▨	LANDS IRRIGATED BY GROUND WATER

KEY TO NUMBERING SYSTEM



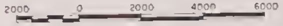
DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISON OF SECTION, eg DIVERSION 25/7E-2K1

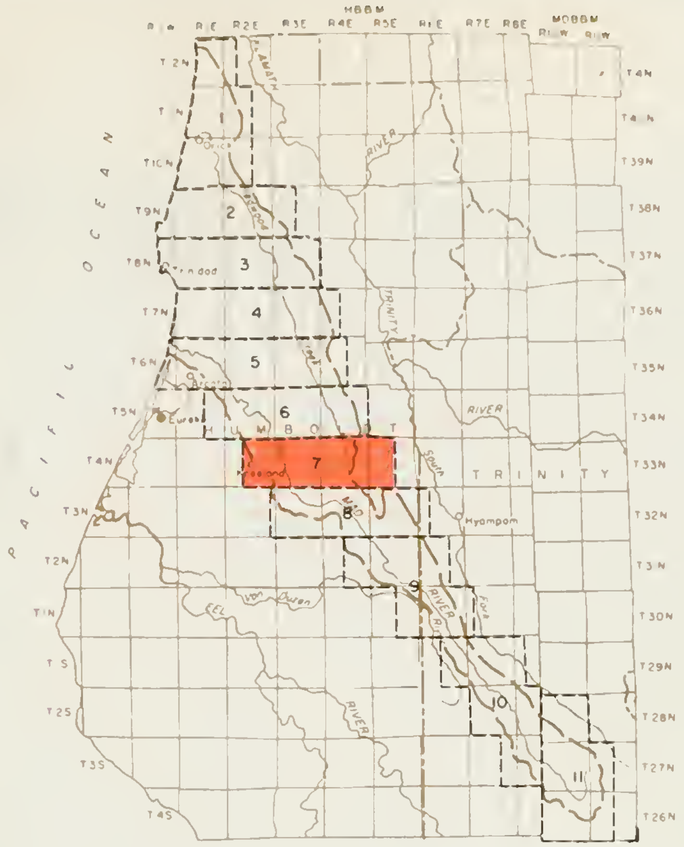
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 5 N, R 1-4 E HB&M
1958

SCALE OF FEET





INDEX TO SHEETS

LEGEND

- GRAVITY DIVERSION
- PUMP DIVERSION
- DIVERSION CANAL OR DITCH
- DIVERSION PIPE
- STREAM GAGING STATION
- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
▨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
🟦	RECREATIONAL LANDS

SYSTEM

A
H
J
R

BERED BY
VISON OF
E-2KI

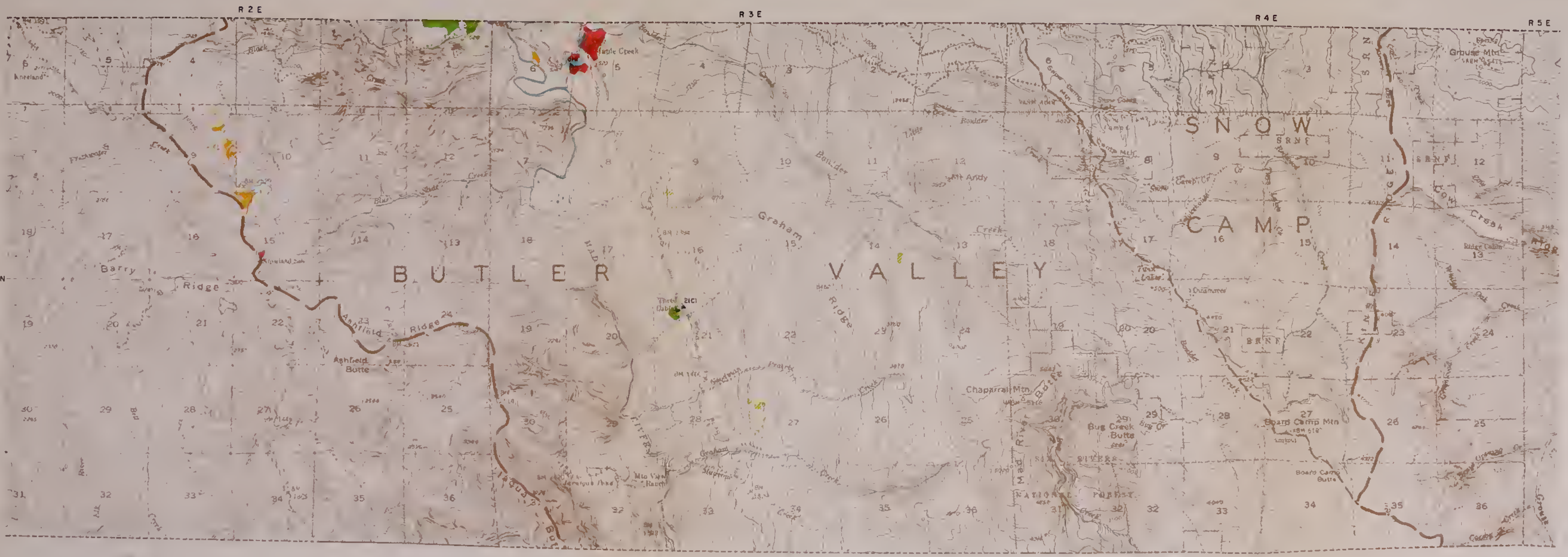
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

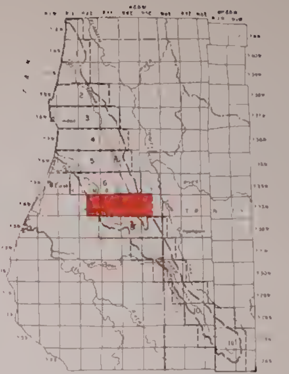
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE

T 4 N, R 2-5 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



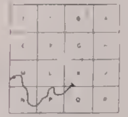

INDEX TO SHEETS

LEGEND

- GRAVITY DIVERSION
- PUMP DIVERSION
- DIVERSION CANAL OR DITCH
- DIVERSION PIPE
- STREAM GAGING STATION
- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
🟨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
🟦	RECREATIONAL LANDS

KEY TO NUMBERING SYSTEM

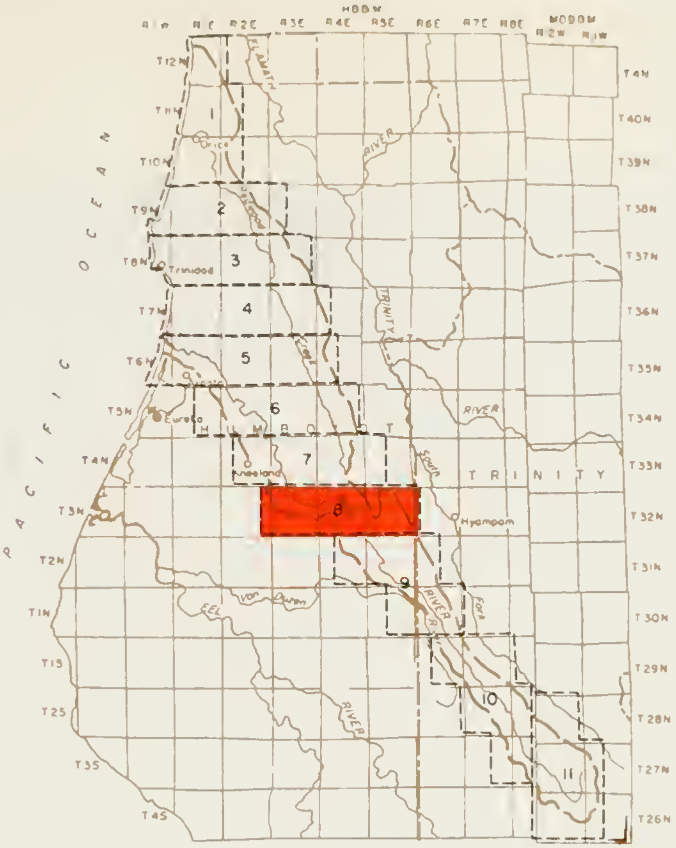


DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP RANGE AND SUBDIVISION OF SECTION AS DIVERSION 25 (TE 25)

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 4 N, R 2-5E HB&M
1958

SCALE OF FEET
2000 0 4000 6000



INDEX TO SHEETS

LEGEND

↗	GRAVITY DIVERSION	🟩	LANDS RECEIVING FULL IRRIGATION
●	PUMP DIVERSION	NONE	LANDS RECEIVING PARTIAL IRRIGATION
↗	DIVERSION CANAL OR DITCH	NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
⇢	DIVERSION PIPE	🟨	NATURALLY IRRIGATED MEADOWLANDS
▼	STREAM GAGING STATION	🟧	DRY FARMED LANDS
～	HYDROGRAPHIC UNIT BOUNDARY	NONE	URBAN LANDS
～	SUBUNIT BOUNDARY	🟪	RECREATIONAL LANDS

ING SYSTEM

B	A
G	H
K	J
Q	R

E NUMBERED BY
SUBDIVISON OF
2S/7E-2K1

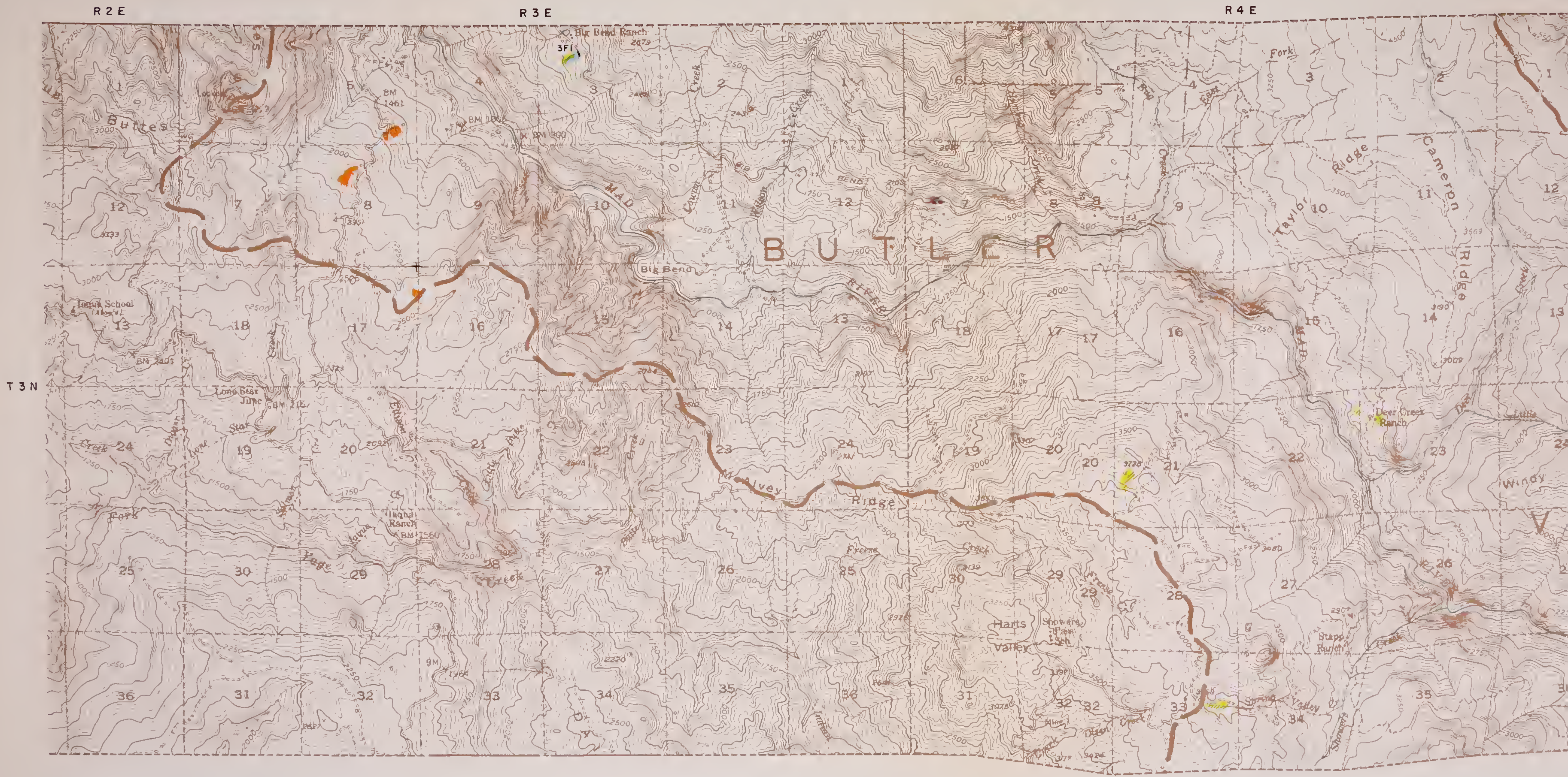
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

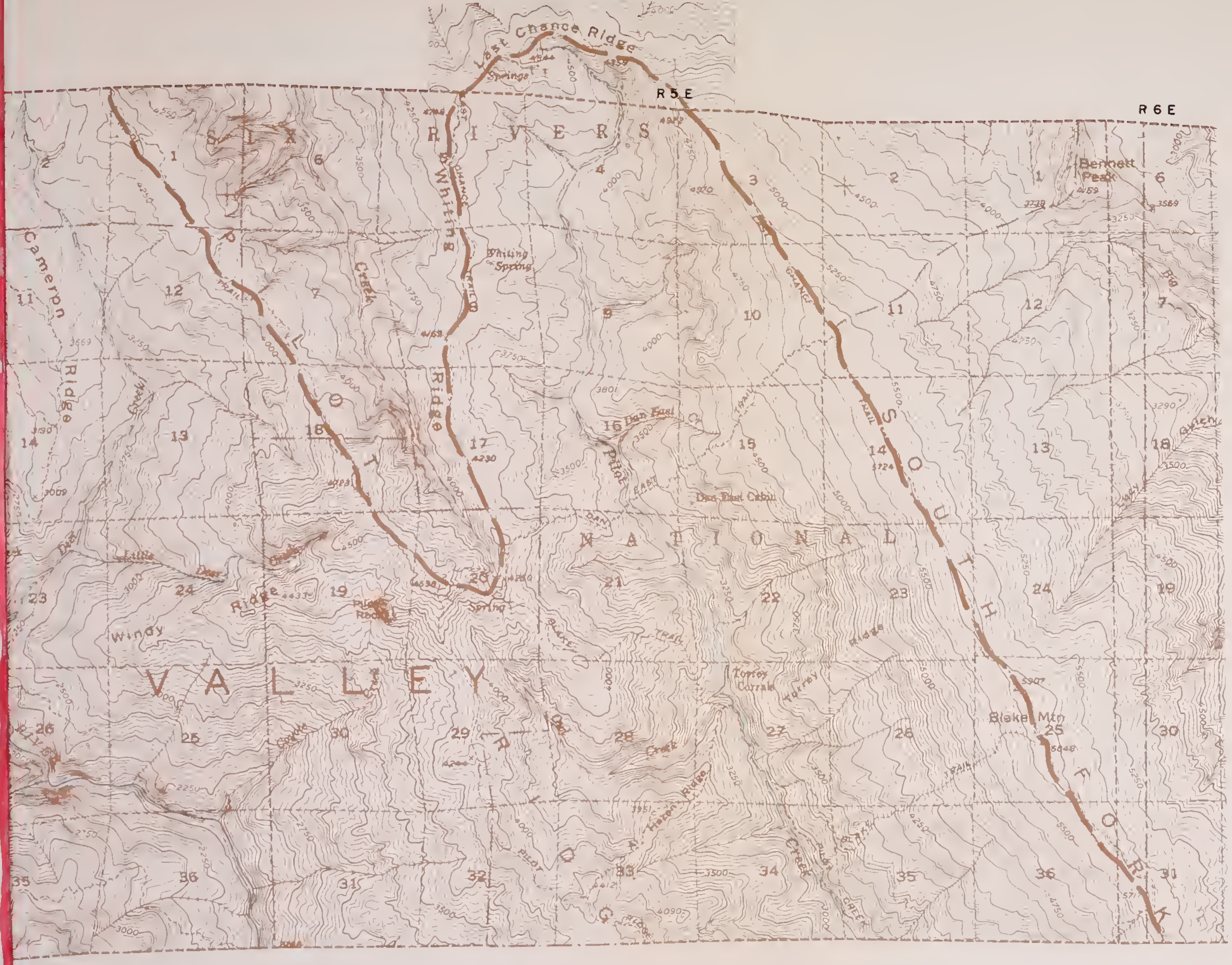
◆

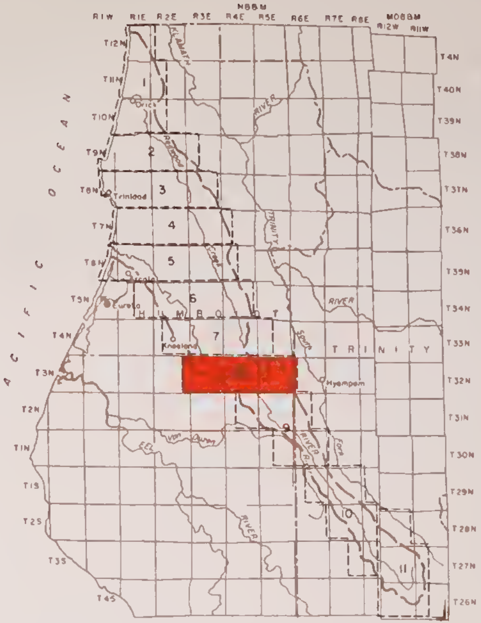
LAND AND WATER USE

T 3 N, R 2-6 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R 2 E
R 3 E
R 4 E
T 3 N
BUTLER
Big Bend Ranch
3F1
Buttes
Big Bend
MAD RIVER
BIG BEND
Cow Creek
Wilson
Iaqua School
Long Star Junc
BM 2401
Lone Star
Iaqua Ranch
Yager Creek
Fork
Pyke
Butte
Little
McAlvey Ridge
Freese Creek
Harts Valley
Showers Pass
Deer Creek Ranch
Taylor Ridge
Cameron Ridge
Windy
Stapp Ranch
Spring Valley
Little Dixon Creek
Mad
Showers
BM 1461
BM 1560





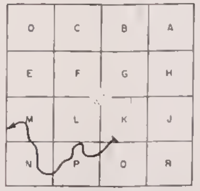
INDEX TO SHEETS

LEGEND

GRAVITY DIVERSION
PUMP DIVERSION
DIVERSION CANAL OR DITCH
DIVERSION PIPE
STREAM GAGING STATION
HYDROGRAPHIC UNIT BOUNDARY
SUBUNIT BOUNDARY

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
🟨	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
NONE	URBAN LANDS
🟪	RECREATIONAL LANDS

KEY TO NUMBERING SYSTEM

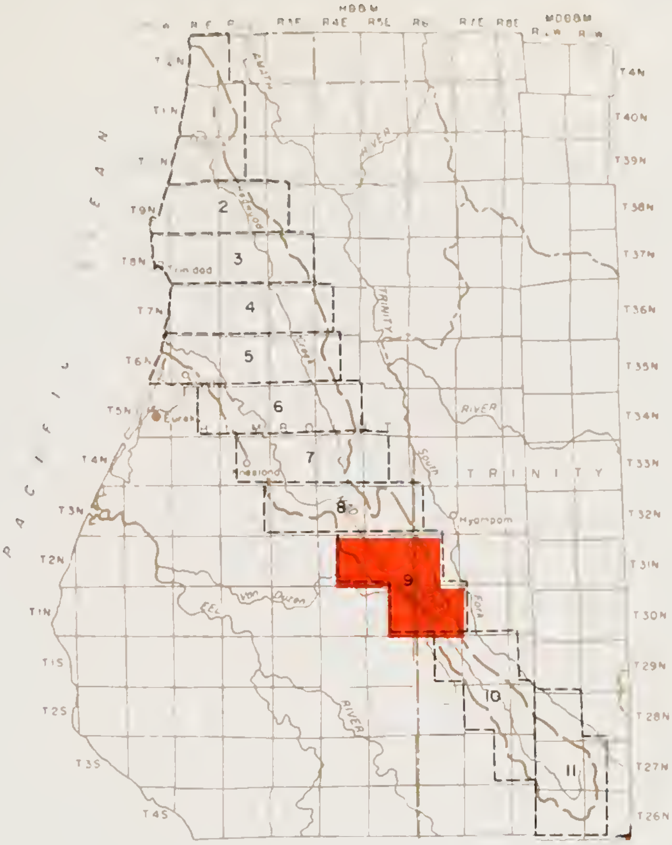


DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISON OF SECTION, eg DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T 3 N, R 2-6 E HBBM
1958

SCALE OF FEET
2000 0 2000 4000 6000



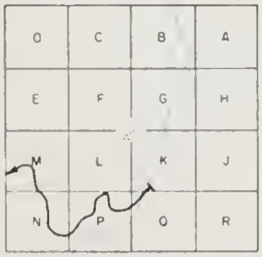
INDEX TO SHEETS

↗	GRAVITY DIVERSION
●	PUMP DIVERSION
↝	DIVERSION CANAL OR DITCH
⇢	DIVERSION PIPE
▼	STREAM GAGING STATION
〰	HYDROGRAPHIC UNIT BOUNDARY
～	SUBUNIT BOUNDARY

LEGEND

NONE	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
NONE	URBAN LANDS
🟪	RECREATIONAL LANDS

KEY TO NUMBERING SYSTEM



D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISON OF SECTION, eg DIVERSION 2S/7E-2K1

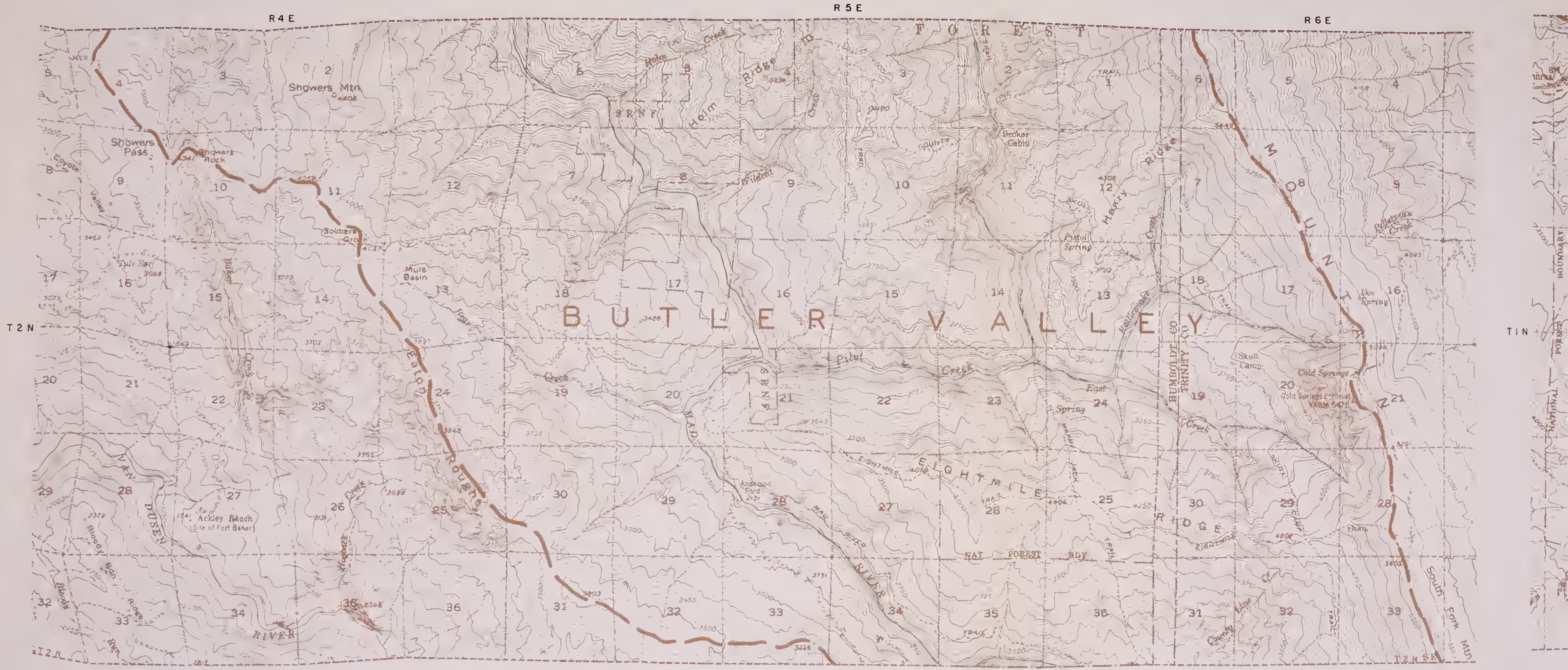
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

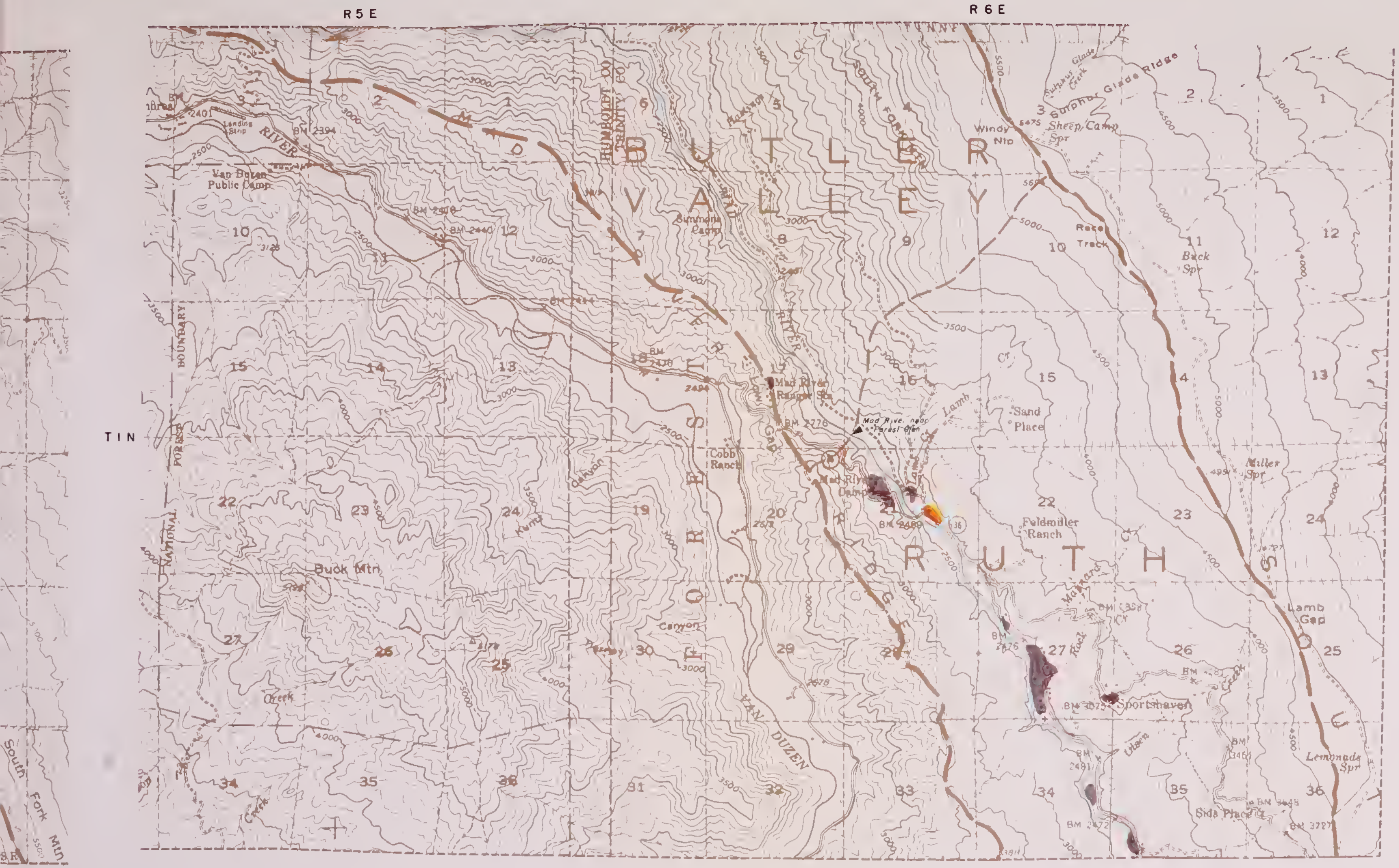
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

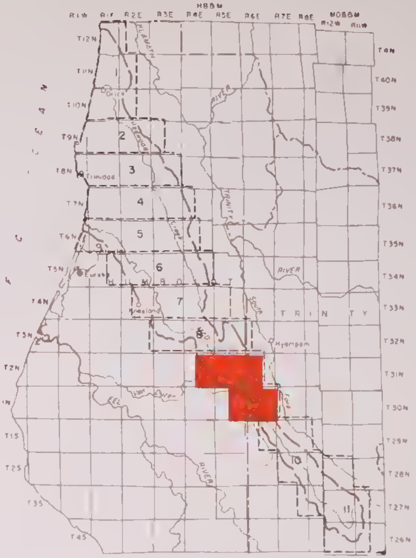
LAND AND WATER USE

T1-2N, R4-6E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R4E
R5E
R6E
T2N
T1N
BUTLER VALLEY
FOREST
MOUNTAIN
Showers Mtn
Showers Pass
Showers Rock
Soldiers Grove
Mule Basin
Tule Spr
Coyote Valley
Baker Creek
Eaton Roughs
Hoist Creek
Holm Ridge
Wildcat
SRNF
Becker Cabin
COUNTY
TRAIL
Pistol Spring
Hefty Ridge
Rattlesnake
Pilot Creek
East Spring
HUMBOLDT CO
TRINITY CO
Skull Camp
Cold Springs
Cold Springs Lookout
Doe Spring
Pelletreau Creek
MAD RIVER
Anderson Ford
EIGHTMILE RIDGE
EIGHTMILE
NAT FOREST BDY
VAN DUSEN RIVER
Ackley Ranch
(Site of Fort Baker)
Bloody Run
Bloody Run Ridge
County Line Cr
South Fork Mtn
T2N R5E





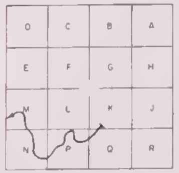
INDEX TO SHEETS

LEGEND

GRAVITY DIVERSION
PUMP DIVERSION
DIVERSION CANAL OR DITCH
DIVERSION PIPE
STREAM GAGING STATION
HYDROGRAPHIC UNIT BOUNDARY
SUBUNIT BOUNDARY

NONE	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
NONE	URBAN LANDS
■	RECREATIONAL LANDS

KEY TO NUMBERING SYSTEM



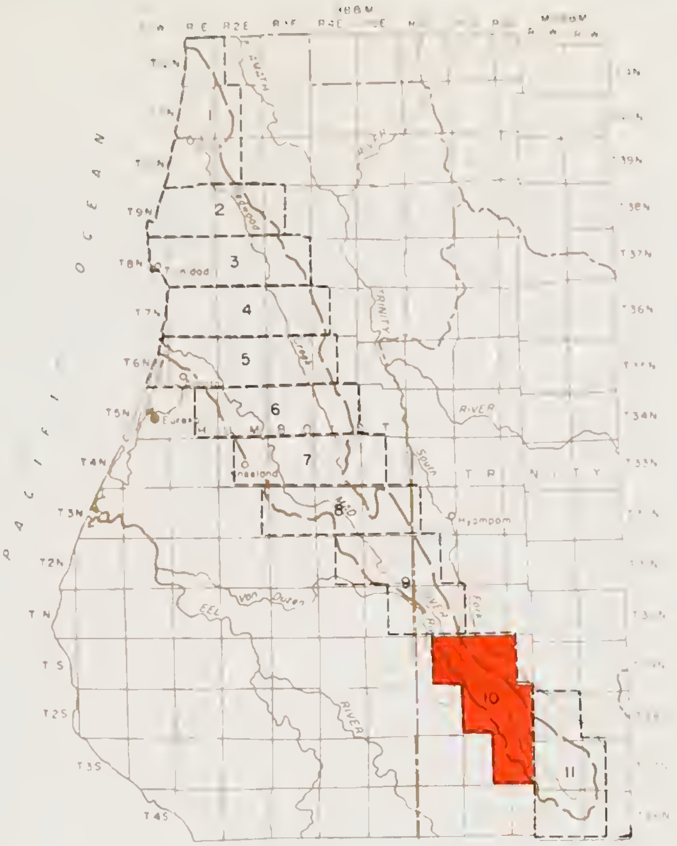
DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISION OF SECTION, eg DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T1-2N, R4-6E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000

Sheet 10 of 11 Sheets PLATE 2



INDEX TO SHEETS

GRAVITY DIVERSION

PUMP DIVERSION

DIVERSION CANAL OR DITCH

DIVERSION PIPE

STREAM GAGING STATION

HYDROGRAPHIC UNIT BOUNDARY

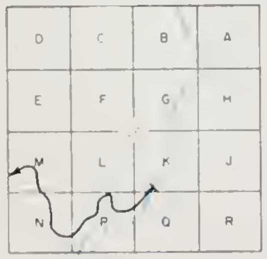
SUBUNIT BOUNDARY

RESERVOIR UNDER CONSTRUCTION

LEGEND

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
🟨	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
🟪	RECREATIONAL LANDS
▨	LANDS IRRIGATED BY GROUND WATER

KEY TO NUMBERING SYSTEM



DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISION OF SECTION, eg DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE

MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

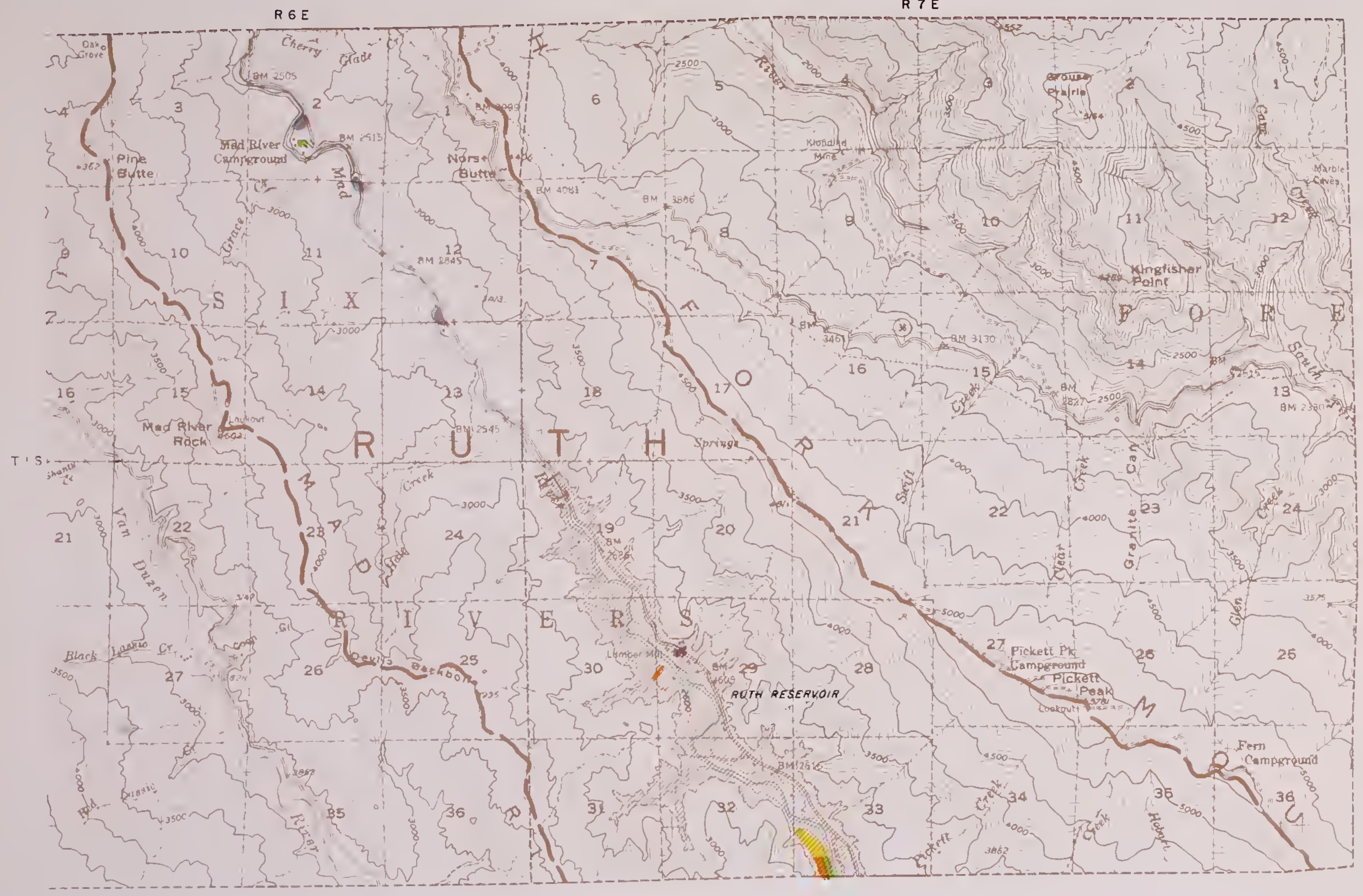
LAND AND WATER USE

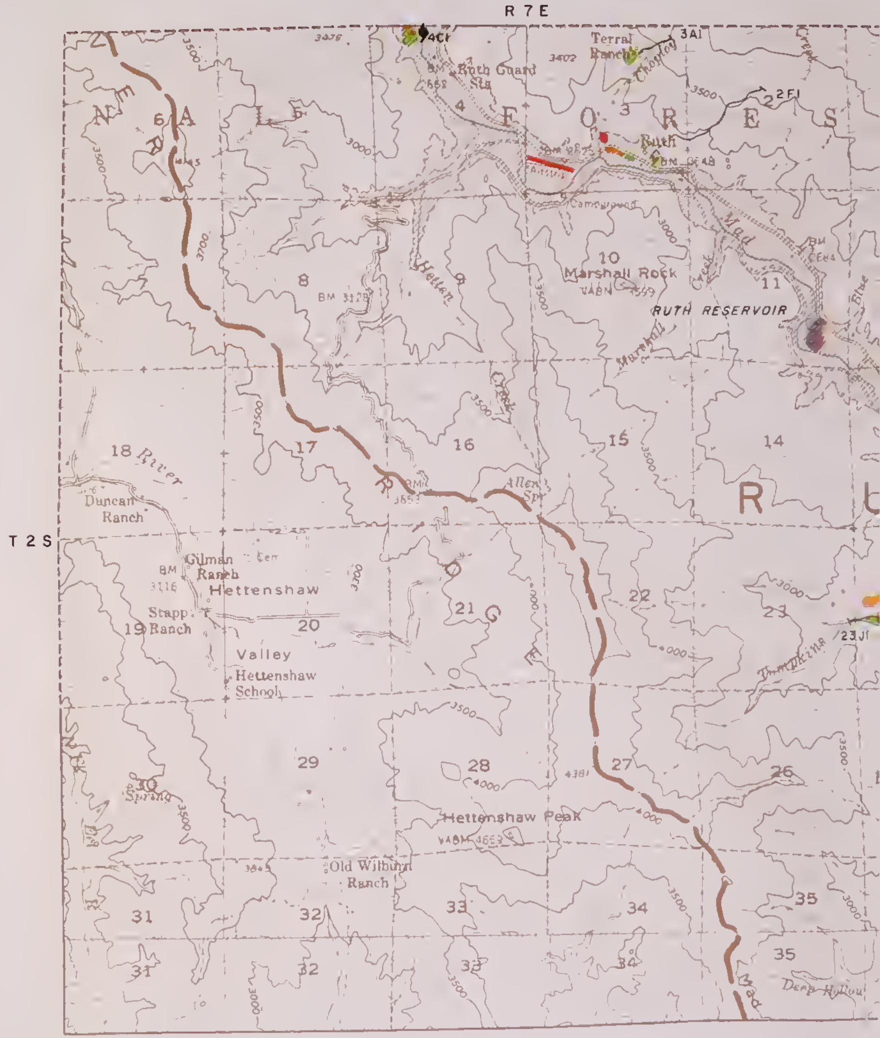
T1-3S, R6-8E HB&M

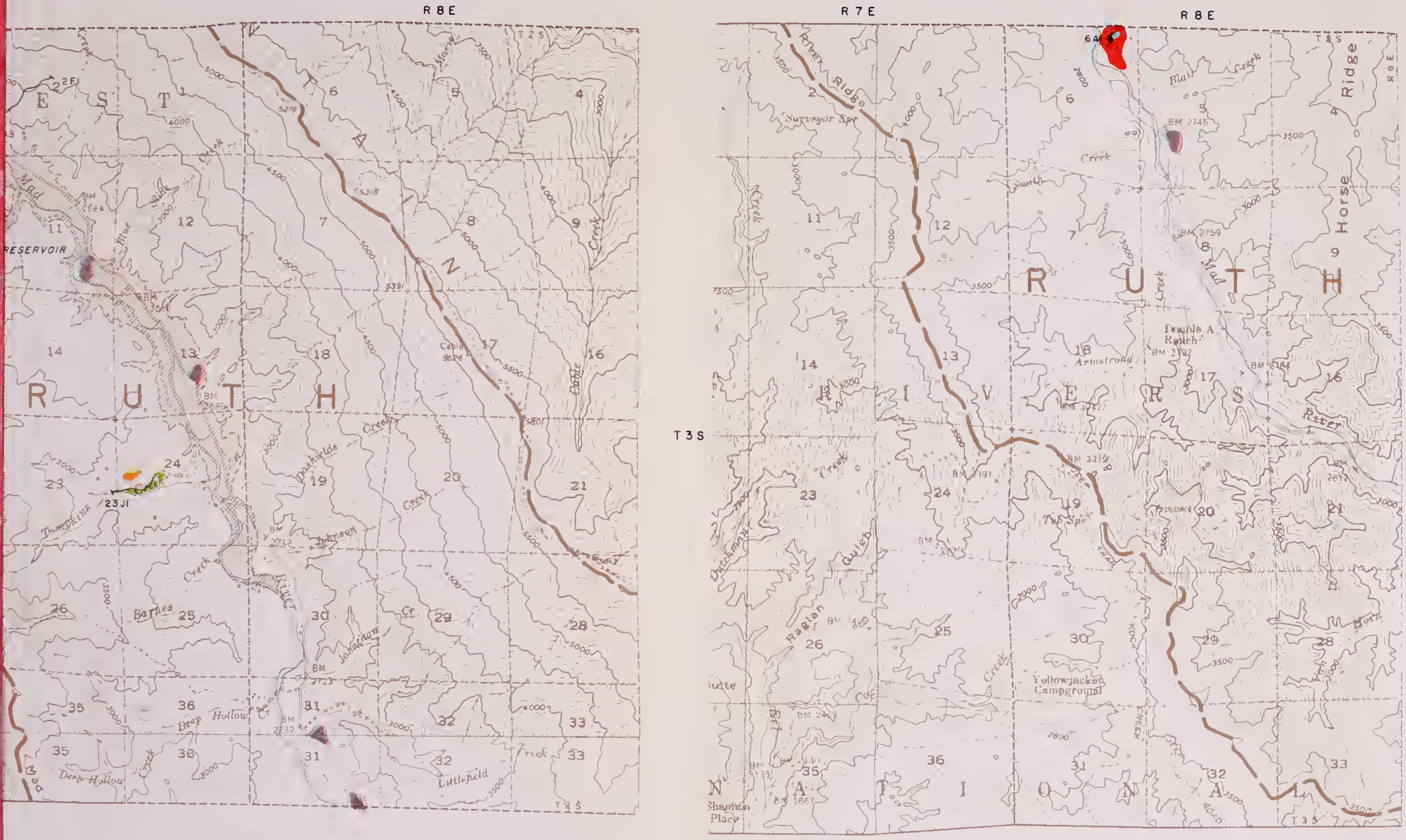
1958

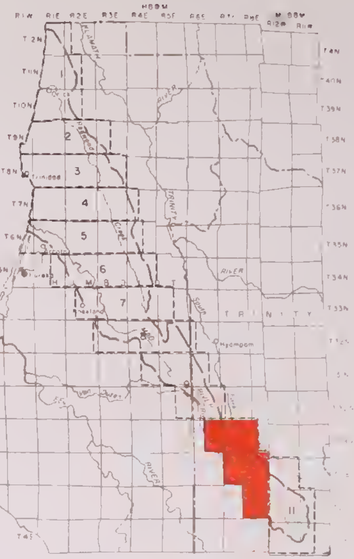
SCALE OF FEET

2000 0 2000 4000 6000


R 6 E
R 7 E
T 1 S
Oak Grove
Cherry Glade Cr.
Pine Butte
Mad River Campground
Mad
Norse Butte
Mad River Rock
Lookout
Klondike Mine
Grouse Prairie
Marble Caves
Kingfisher Point
S I X
R U T H
F O R K
M A D
R I V E R S
F O R E
Grace
Swift Creek
Clear Creek
Granite Creek
Can Creek
Glen Creek
South Fork
Van Duzen
Black Lassic Cr.
Lassic
Red
Lewis
Barnboy
River
Spring
Lumber Mill
RUTH RESERVOIR
Pickett Pk. Campground
Pickett Peak
Lookout
Fern Campground
Pickett Creek
Hobart
Creek
M O U
BM 2505
BM 2513
BM 4081
BM 3886
BM 2845
BM 3461
BM 3130
BM 2545
BM 2330
BM 2616
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36


R 7 E
T 2 S
4C1
3A1
2F1
Terral Ranch
Chopfog
Ruth Guard Sta.
Ruth
Campground
Marshall Rock
RUTH RESERVOIR
Mad
Hetten
Marshall
Creek
N E A L E
F O R E S
R I D G E
R
18 River
Duncan Ranch
Gilman Ranch
Hettenshaw
Stapp Ranch
Valley
Hettenshaw School
Allen Spr.
Spring
Hettenshaw Peak
Old Wilburn Ranch
Pumpkin
Deep Hollow
BM 3116
BM 3125
1
3
4
6
7
8
9
10
11
14
15
16
17
19
20
21
22
23
26
27
28
29
30
31
32
33
34
35



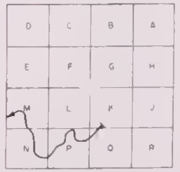

INDEX TO SHEETS

- GRAVITY DIVERSION
- PUMP DIVERSION
- DIVERSION CANAL OR DITCH
- DIVERSION PIPE
- STREAM GAGING STATION
- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- RESERVOIR UNDER CONSTRUCTION

LEGEND

🟩	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
🟨	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
🟧	DRY FARMED LANDS
🟥	URBAN LANDS
🟪	RECREATIONAL LANDS
☐	LANDS IRRIGATED BY GROUND WATER

KEY TO NUMBERING SYSTEM



DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISION OF SECTION eg DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

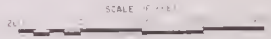
LAND AND WATER USE

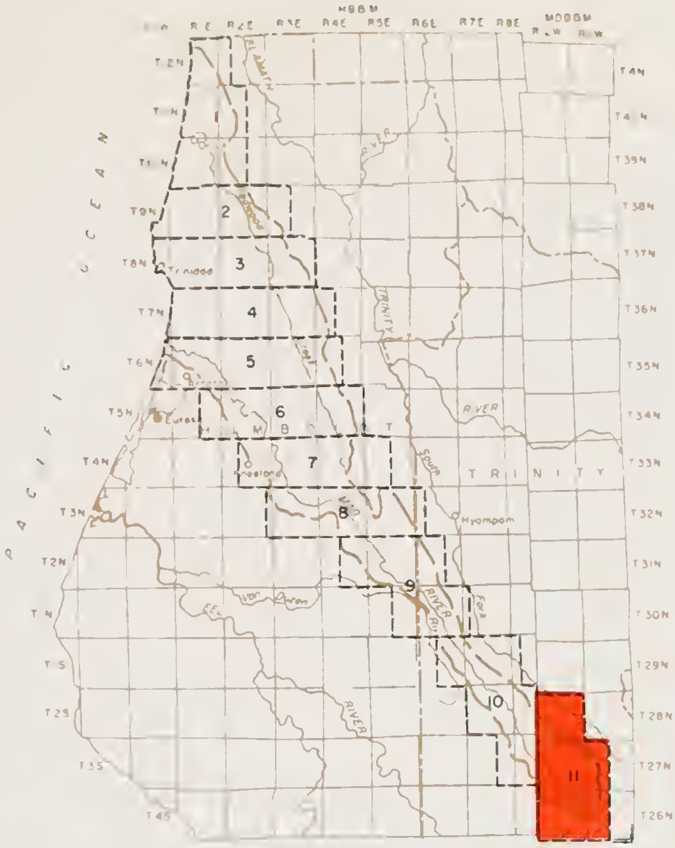
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE

T1-3S, R6-8E HB&M

1958





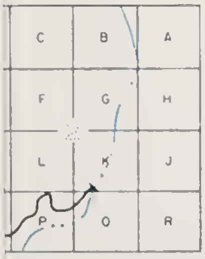
INDEX TO SHEETS

LEGEND

GRAVITY DIVERSION
PUMP DIVERSION
DIVERSION CANAL OR DITCH
DIVERSION PIPE
STREAM GAGING STATION
HYDROGRAPHIC UNIT BOUNDARY
SUBUNIT BOUNDARY

NONE	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
NONE	DRY FARMED LANDS
NONE	URBAN LANDS
NONE	RECREATIONAL LANDS

NUMBERING SYSTEM

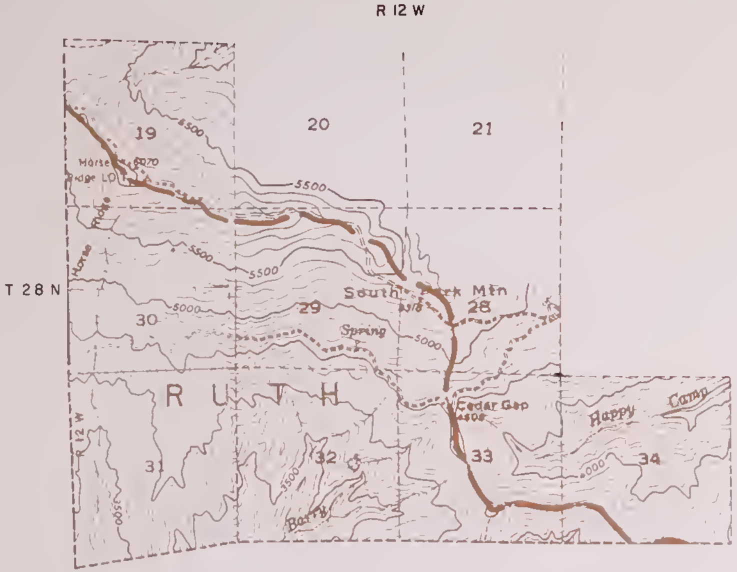


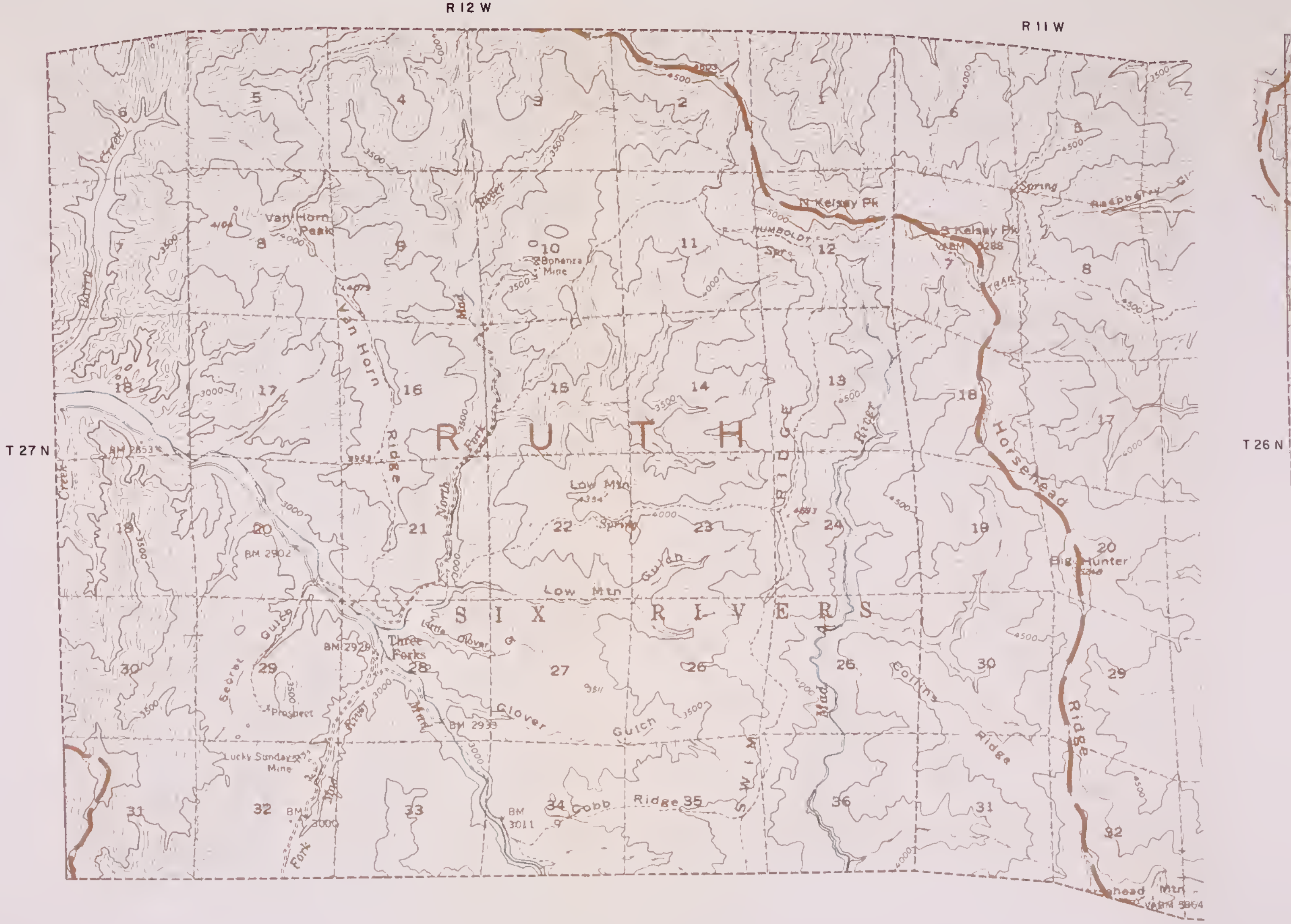
S SHOWN ARE NUMBERED BY
RANGE AND SUBDIVISON OF
g DIVERSION 2S/7E-2K1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

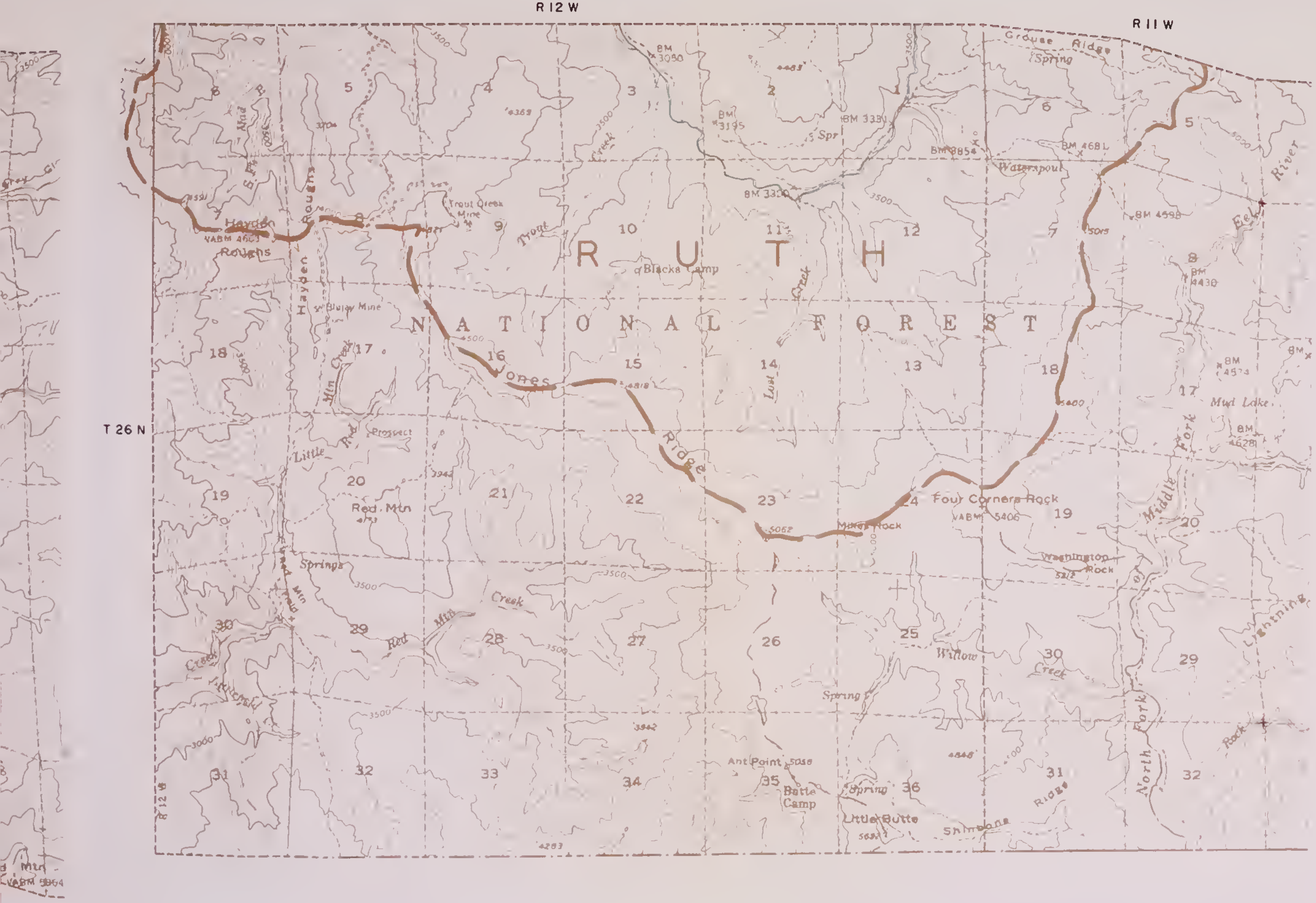
LAND AND WATER USE
T 26-28 N, R 11-12 W MDB&M
1958

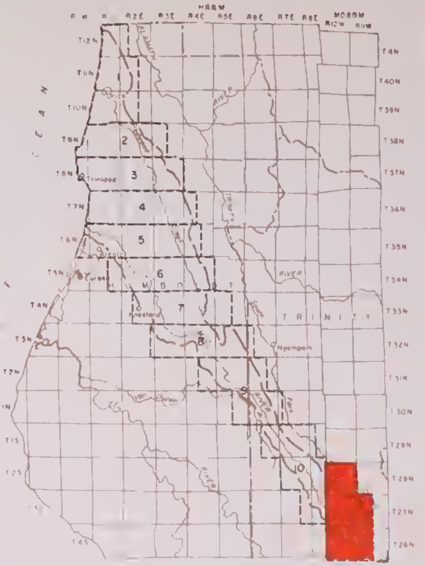
SCALE OF FEET
2000 0 2000 4000 6000


R 12 W
T 28 N
19
20
21
Horse Ridge LO
Horse Ridge
5500
South Fork Mtn
29
28
30
Spring
R U T H
Cedar Gap
Happy Camp
31
32
33
34
Barry
R 12 W


R 12 W
R 11 W
T 27 N
T 26 N
5
4
3
2
1
6
5
6
Barry Creek
Van Horn Peak
8
9
10
Bonanza Mine
11
12
N Kelsey Pk
S Kelsey Pk
7
8
HUMBOLDT
Spring
Raspberry
Van Horn Ridge
Mad River
North Fork
18
17
16
15
14
13
18
17
R U T H
Low Mtn
Spring
Ridge
Horsehead
19
20
21
22
23
24
19
20
Big Hunter
BM 2853
BM 2902
Gulch
Low Mtn
S I X
R I V E R S
Secret Gulch
Three Forks
Little Clover Cr
BM 2926
30
29
28
27
26
25
30
29
Prospect
Clover Gulch
BM 2939
Collins Ridge
Mad
Lucky Sunday Mine
31
32
33
34
35
36
31
32
Fork
Mad
BM 3011
Cobb Ridge
Swim Ridge
Horsehead Mtn
VABM 5904
3000
3500
4000
4500
5000

Sheet 11 of 11 Sheets PLATE 2





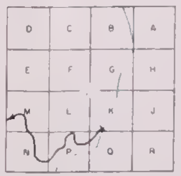
INDEX TO SHEETS

LEGEND

GRAVITY DIVERSION
PUMP DIVERSION
DIVERSION CANAL OR DITCH
DIVERSION PIPE
STREAM GAGING STATION
HYDROGRAPHIC UNIT BOUNDARY
SUBUNIT BOUNDARY

NONE	LANDS RECEIVING FULL IRRIGATION
NONE	LANDS RECEIVING PARTIAL IRRIGATION
NONE	LANDS USUALLY IRRIGATED BUT IDLE OR FALLOW IN 1958
NONE	NATURALLY IRRIGATED MEADOWLANDS
NONE	DRY FARMED LANDS
NONE	URBAN LANDS
NONE	RECREATIONAL LANDS

KEY TO NUMBERING SYSTEM



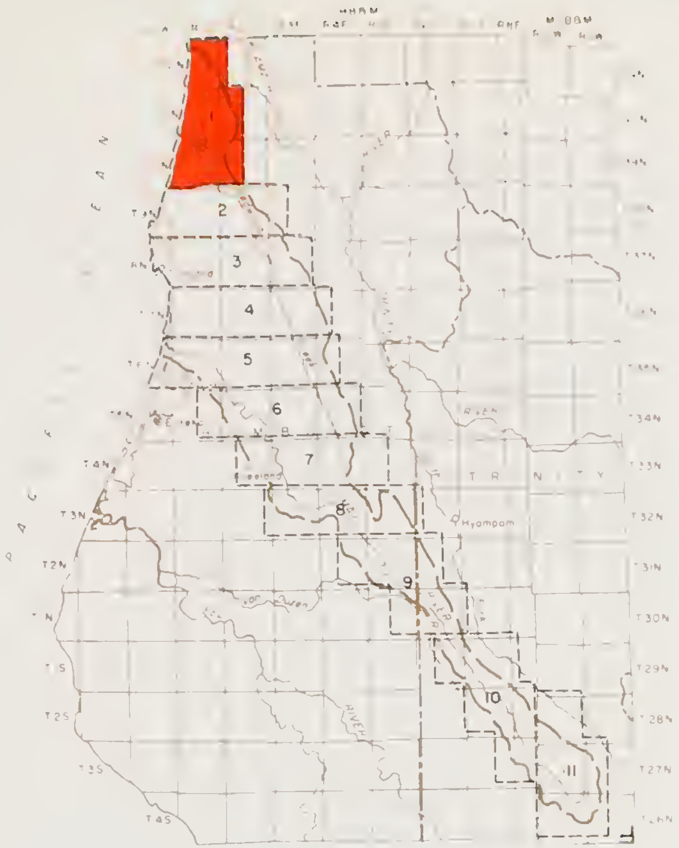
DIVERSIONS SHOWN ARE NUMBERED BY TOWNSHIP, RANGE AND SUBDIVISON OF SECTION, eg DIVERSION 25/7E-2M1

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

LAND AND WATER USE
T26-28N, R11-12W MDB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY

〰 SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

🟥 STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

🟥 PRESENT URBAN LANDS (U)

🟪 RECREATIONAL LANDS (R)

🟨 MARSH OR SWAMP

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

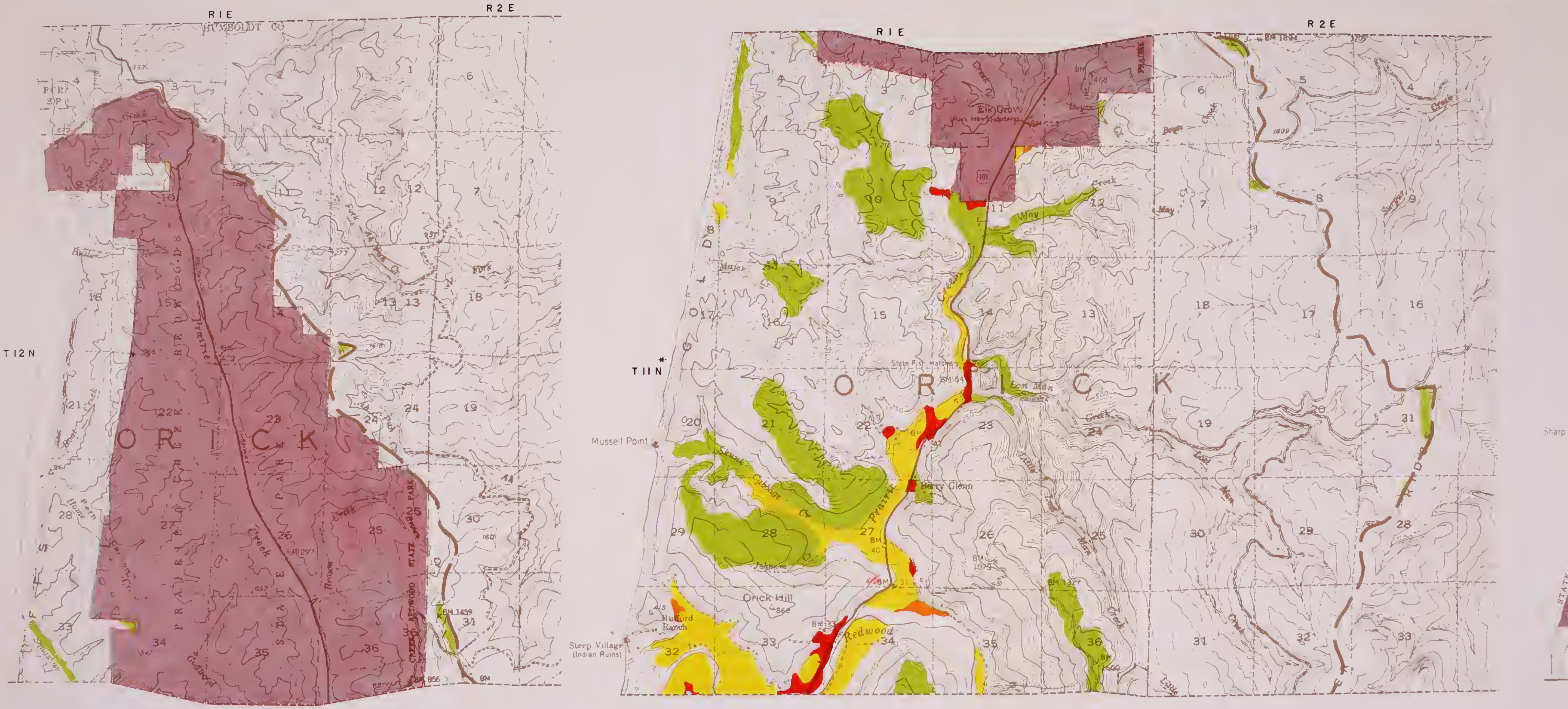
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

◆

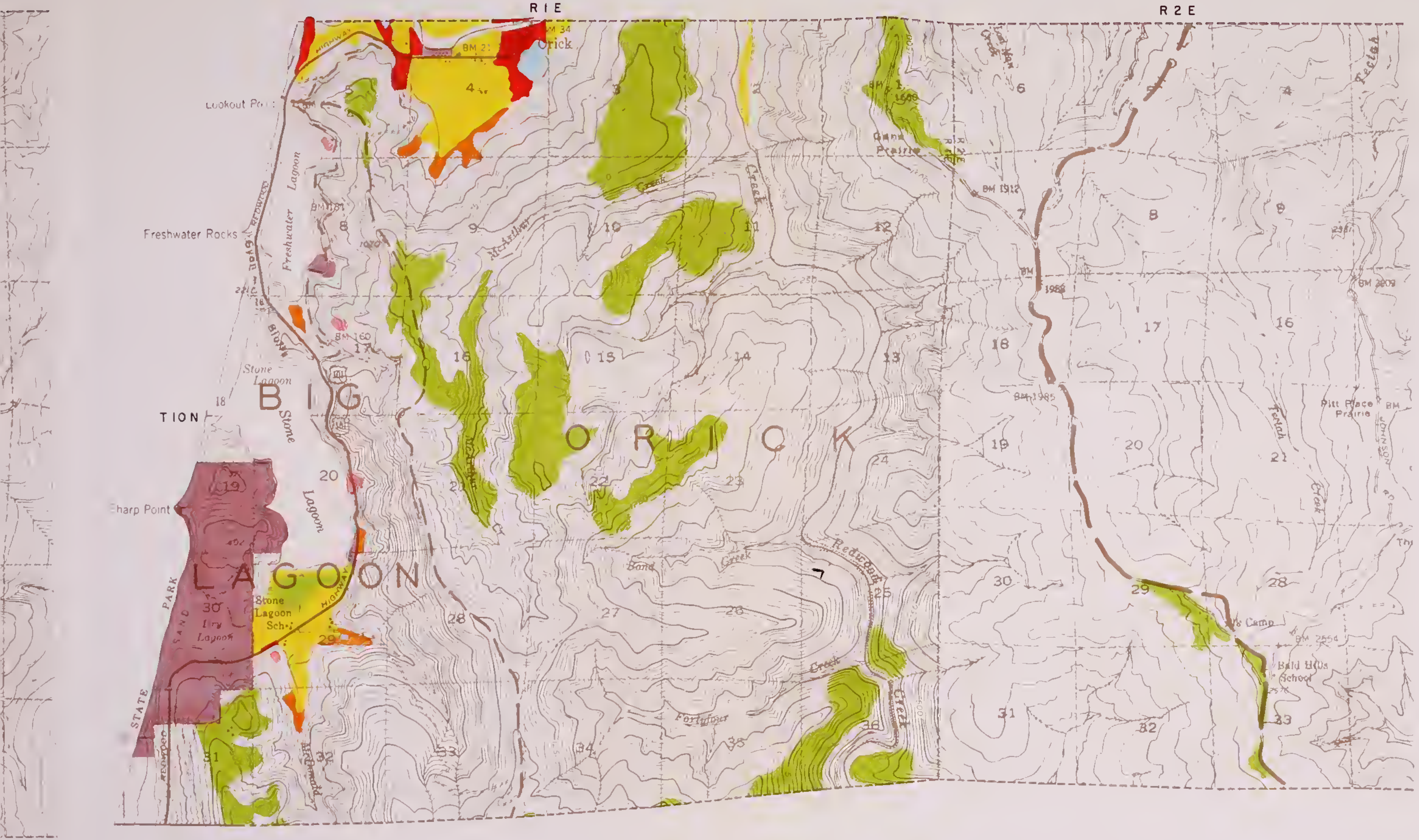
CLASSIFICATION OF LANDS

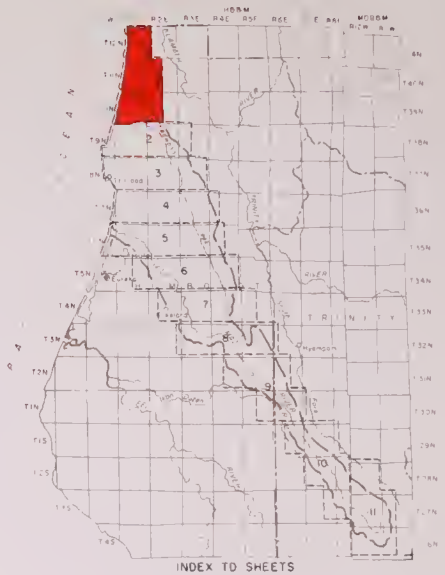
T10-12N, R1W-2E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R1E
R2E
HUMBOLDT CO
T12N
T11N
O R I C K
PRAIRIE CREEK REDWOODS STATE PARK
Prairie Creek
Mussell Point
Steep Village
(Indian Ruins)
Hufford Ranch
Orick Hill
Berry Glenn
State Fish Hatchery
Elk Grove
Lost Man Creek
Redwood Creek
May Creek
Boyes Creek
Skunk Cabbage Cr.
Johnson Cr.
GOLD BLUFFS
Sharp

Sheet 1 of 11 Sheets PLATE 3





INDEX TO SHEETS

LEGEND

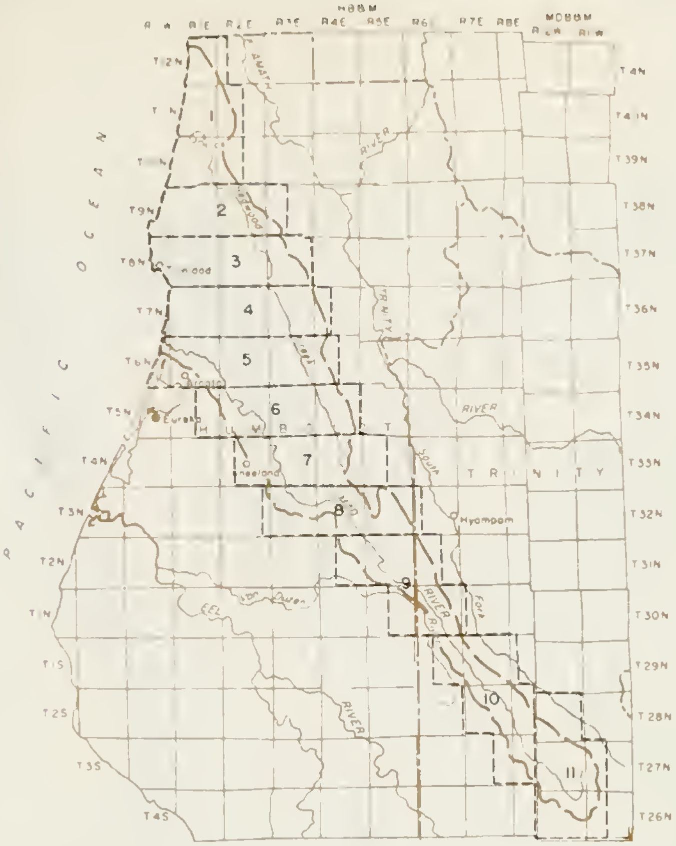
- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- 🟨 SMOOTH LYING IRRIGABLE LANDS (V)
- 🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
- 🟥 STEEPLY SLOPING IRRIGABLE LANDS (M)
- 🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
- 🟥 PRESENT URBAN LANDS (U)
- 🟪 RECREATIONAL LANDS (R)
- 🟨 MARSH OR SWAMP

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS
T10-12N, R1W-2E HB&M
1958

SCALE OF FEET
0 2000 4000 6000



INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY

〰 SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

▨ STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

🟥 PRESENT URBAN LANDS (U)

🟪 RECREATIONAL LANDS (R)

🟨 MARSH OR SWAMP

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

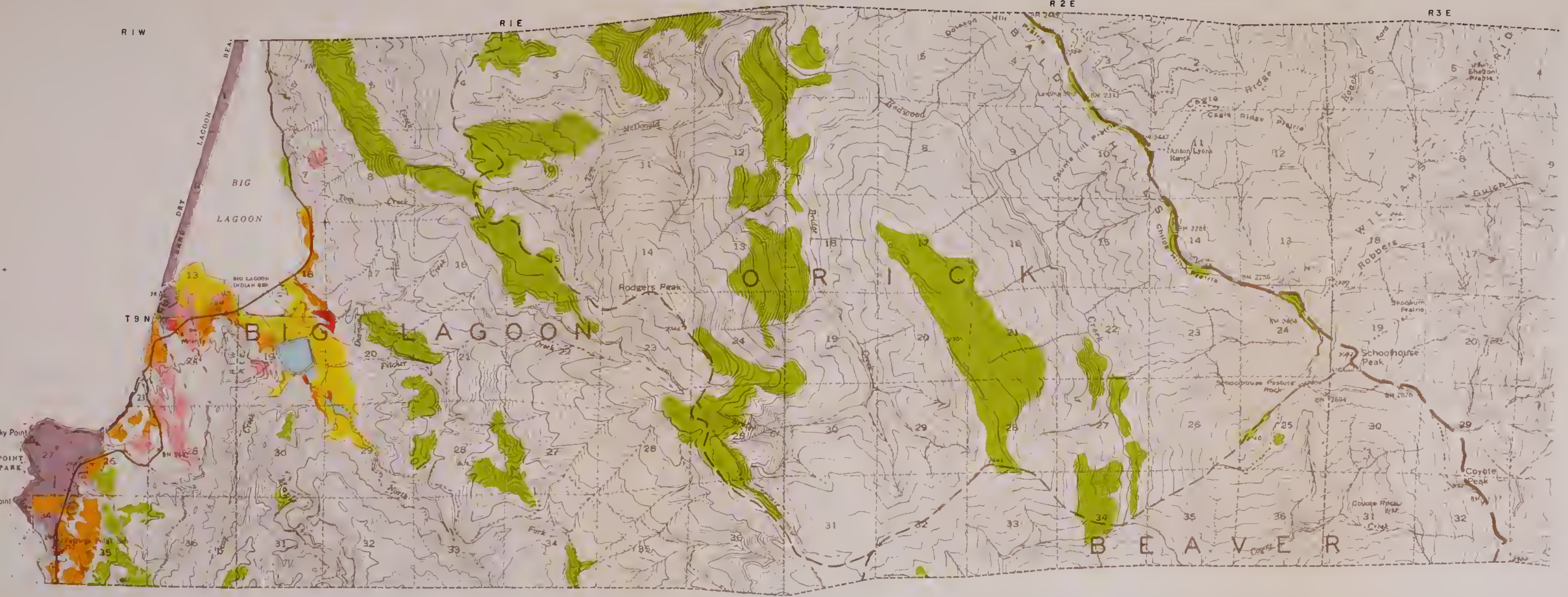
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

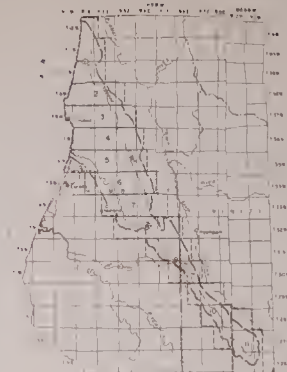
◆

CLASSIFICATION OF LANDS

T 9 N, R1W-3E HBBM
1958

SCALE OF FEET
2000 0 2000 4000 6000




INDEX TO SHEETS

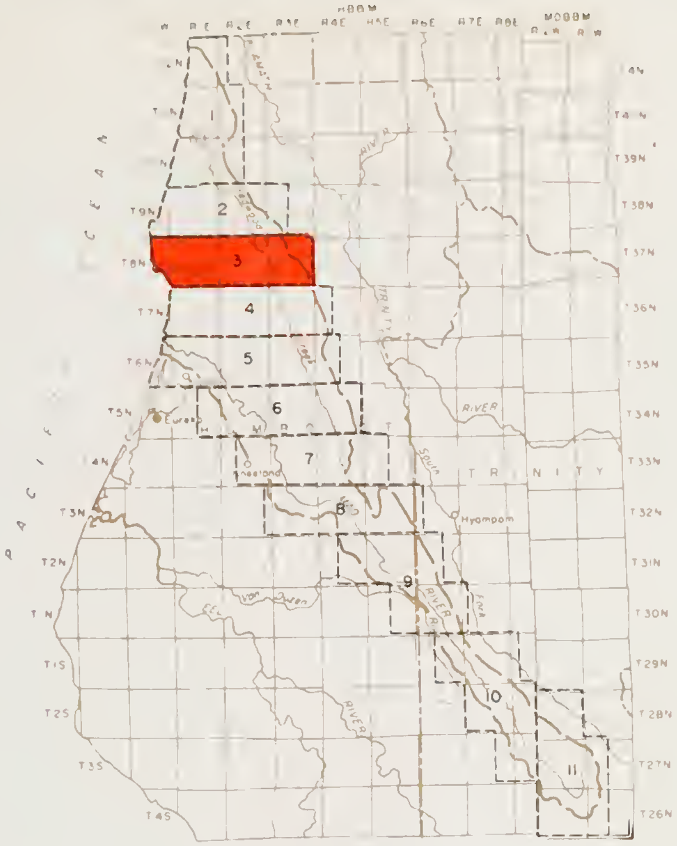
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T 9 N, R1W-3E HB&M
1958

SCALE IN FEET



INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY

〰 SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

▨ STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

🟥 PRESENT URBAN LANDS (U)

🟪 RECREATIONAL LANDS (R)

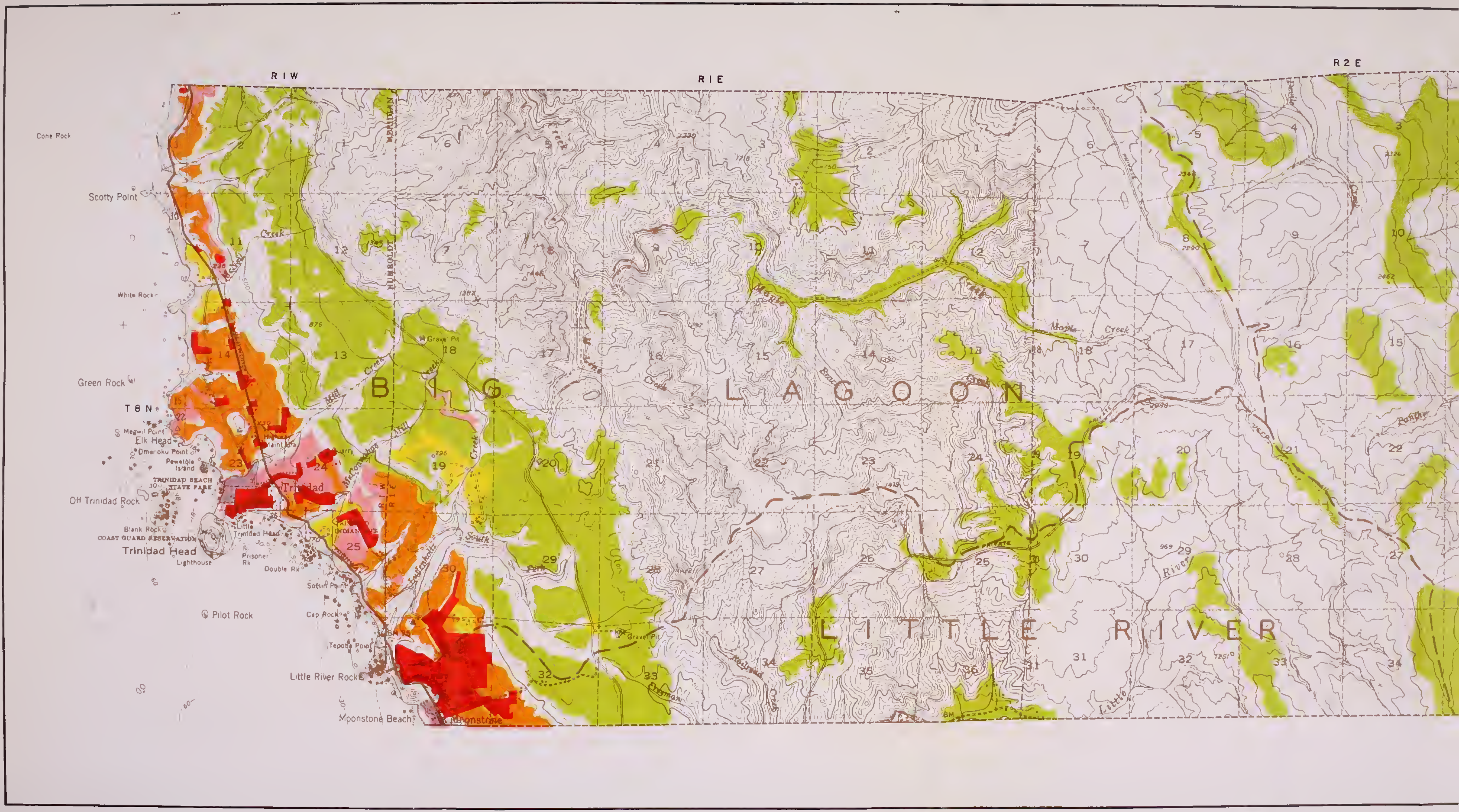
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

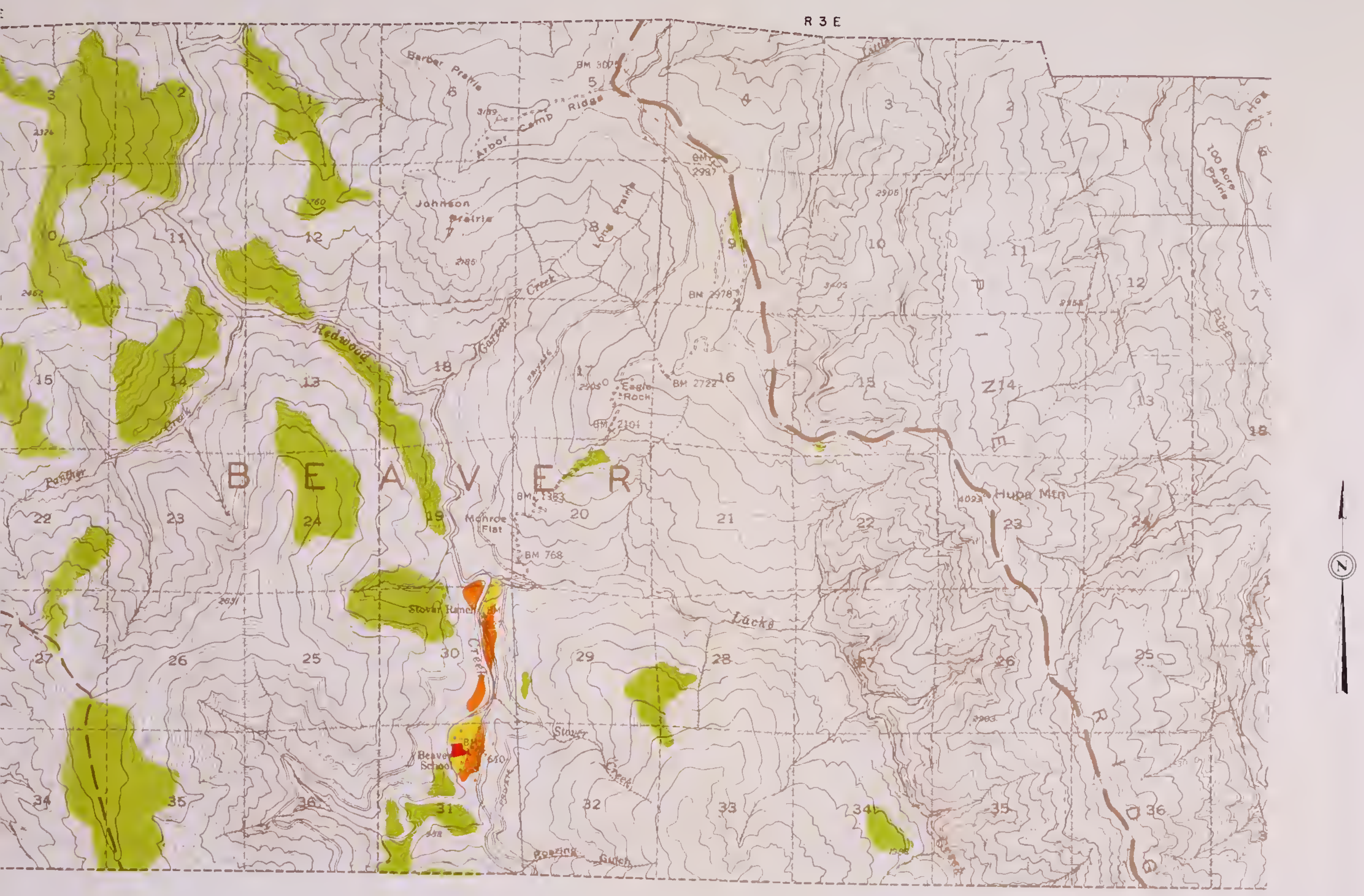
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

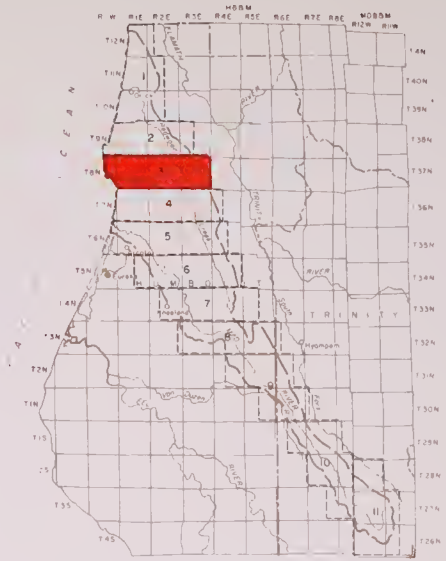
◆

CLASSIFICATION OF LANDS
T 8 N, R 1 W - 3 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R1W
R1E
R2E
Cone Rock
Scotty Point
White Rock
Green Rock
T8N
Megwil Point
Elk Head
Omenoku Point
Pewetole Island
TRINIDAD BEACH STATE PARK
Off Trinidad Rock
Blank Rock
COAST GUARD RESERVATION
Trinidad Head
Lighthouse
Little Trinidad Head
Prisoner Rk
Double Rk
Sotsin Point
Pilot Rock
Cap Rock
Tepona Point
Little River Rock
Moonstone Beach
Moonstone
Trinidad
Quarry
Gravel Pit
HUMBOLDT MERIDIAN
INDIAN
B I G
L A G O O N
L I T T L E
R I V E R
Mill Creek
Maple Creek
Panther
Little River
Creek
South
Fork
Strawberry
R1W R1E
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36





INDEX TO SHEETS

LEGEND

- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- 🟨 SMOOTH LYING IRRIGABLE LANDS (V)
- 🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
- ▨ STEEPLY SLOPING IRRIGABLE LANDS (M)
- 🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
- 🟥 PRESENT URBAN LANDS (U)
- ▨ RECREATIONAL LANDS (R)

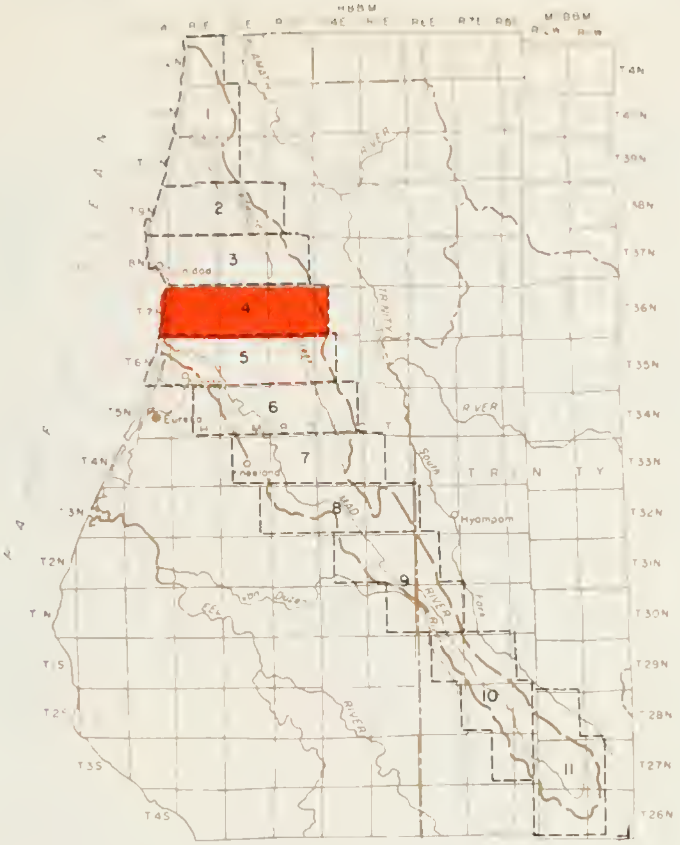
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T 8 N, R1W-3E HBBM
1958

SCALE OF FEET



INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY

〰 SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

🟥 STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

🟥 PRESENT URBAN LANDS (U)

🟪 RECREATIONAL LANDS (R)

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

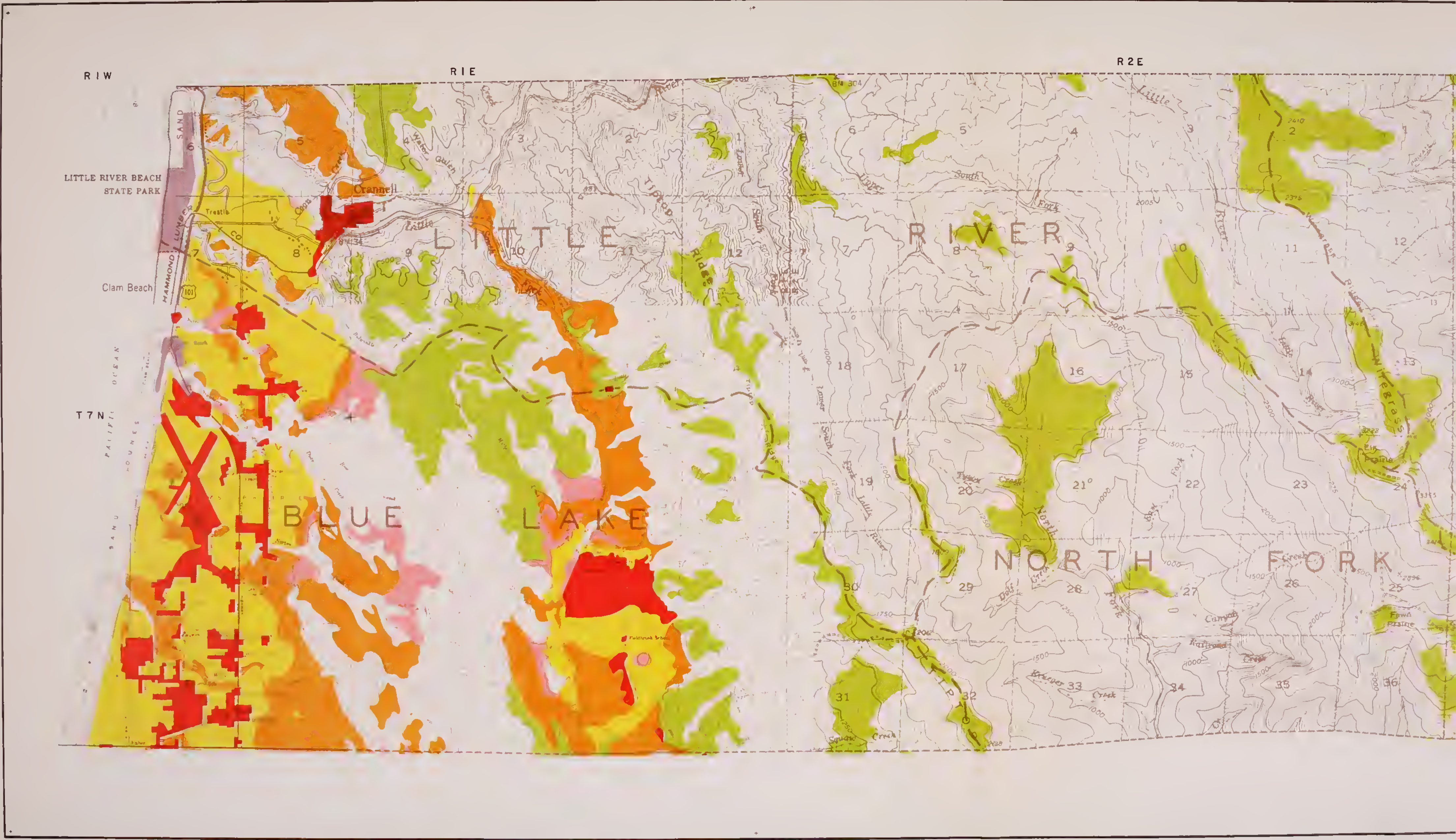
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

◆

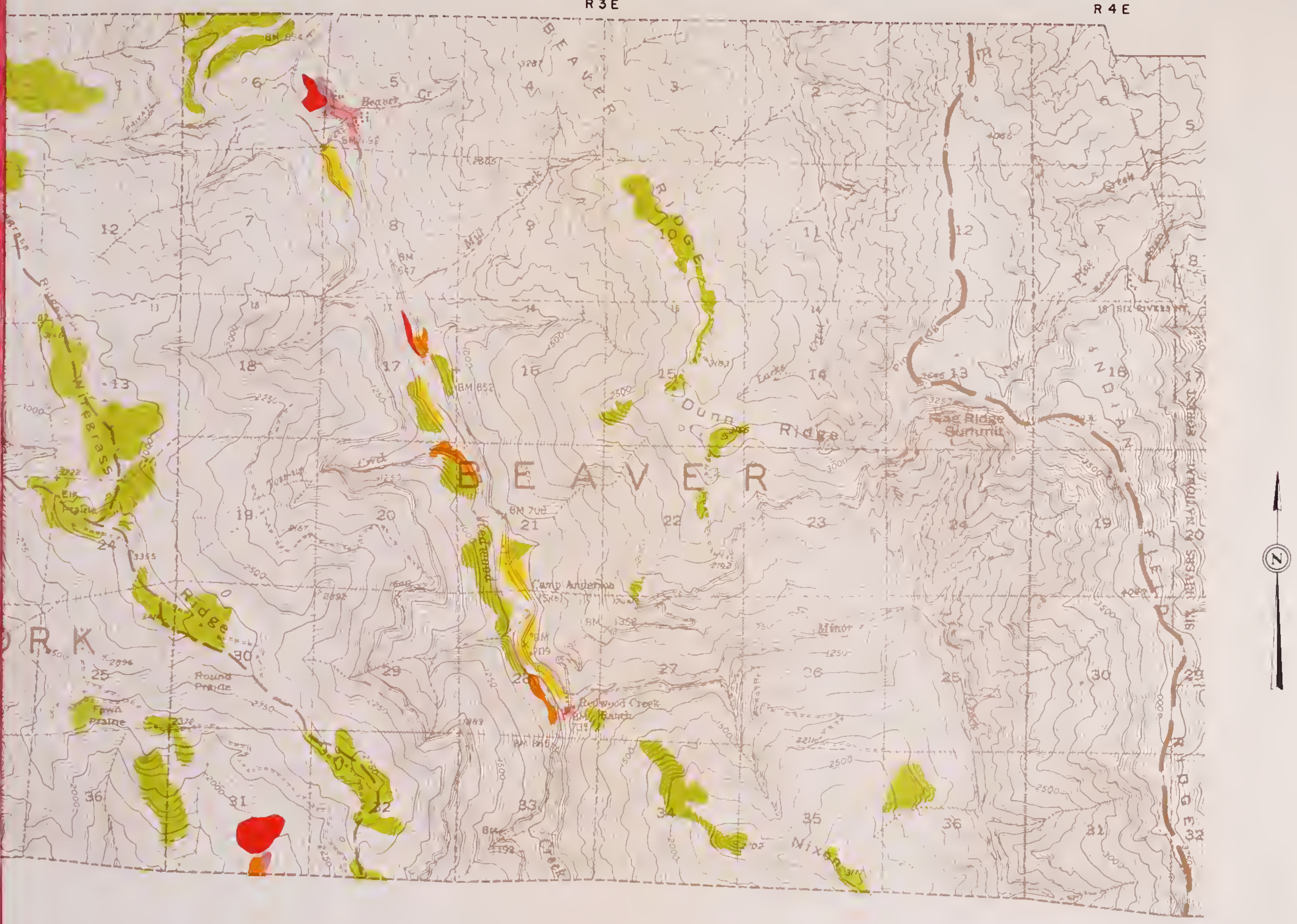
CLASSIFICATION OF LANDS

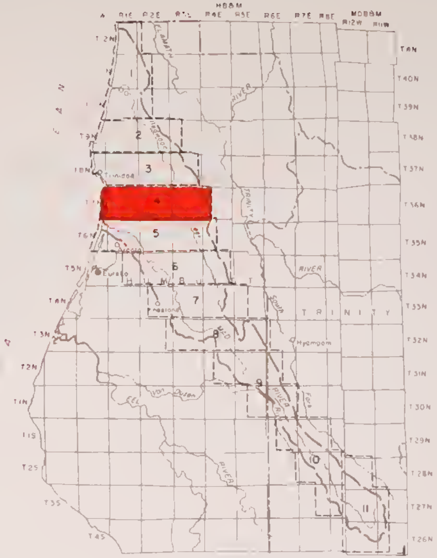
T 7 N, R 1 W - 4 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R1W
R1E
R2E
T7N
LITTLE RIVER BEACH
STATE PARK
Clam Beach
SAND
HAMMOND LUMBER CO
101
PACIFIC OCEAN
SAND DUNES
Crannell
Trestle
LITTLE RIVER
BLUE LAKE
NORTH FORK
Tipton
Ridge
Little
River
South
Fork
Water Gulch
Upper
Lower
Fawn Prairie
Elk Prairie
Canyon
Railroad
Creek
Krueger
Squaw
Dows
Fieldbrook School

Sheet 4 of 11 Sheets PLATE 3





INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY

〰 SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

▨ STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

🟥 PRESENT URBAN LANDS (U)

▨ RECREATIONAL LANDS (R)

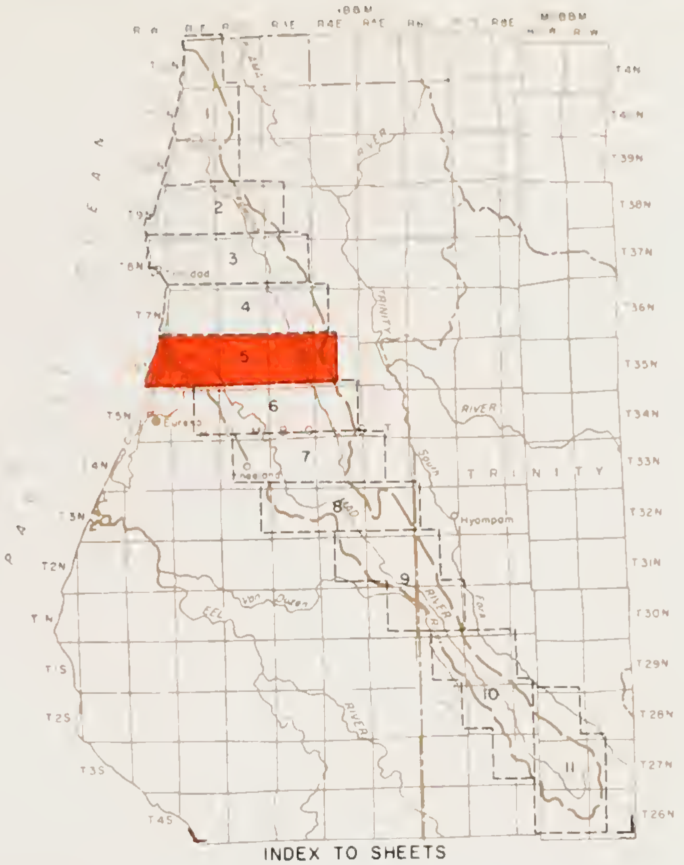
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T 7 N, R 1 W-4 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



INDEX TO SHEETS

LEGEND

— HYDROGRAPHIC UNIT BOUNDARY

— SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

▨ STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

🟥 PRESENT URBAN LANDS (U)

🟪 RECREATIONAL LANDS (R)

🟨 MARSH OR SWAMP

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

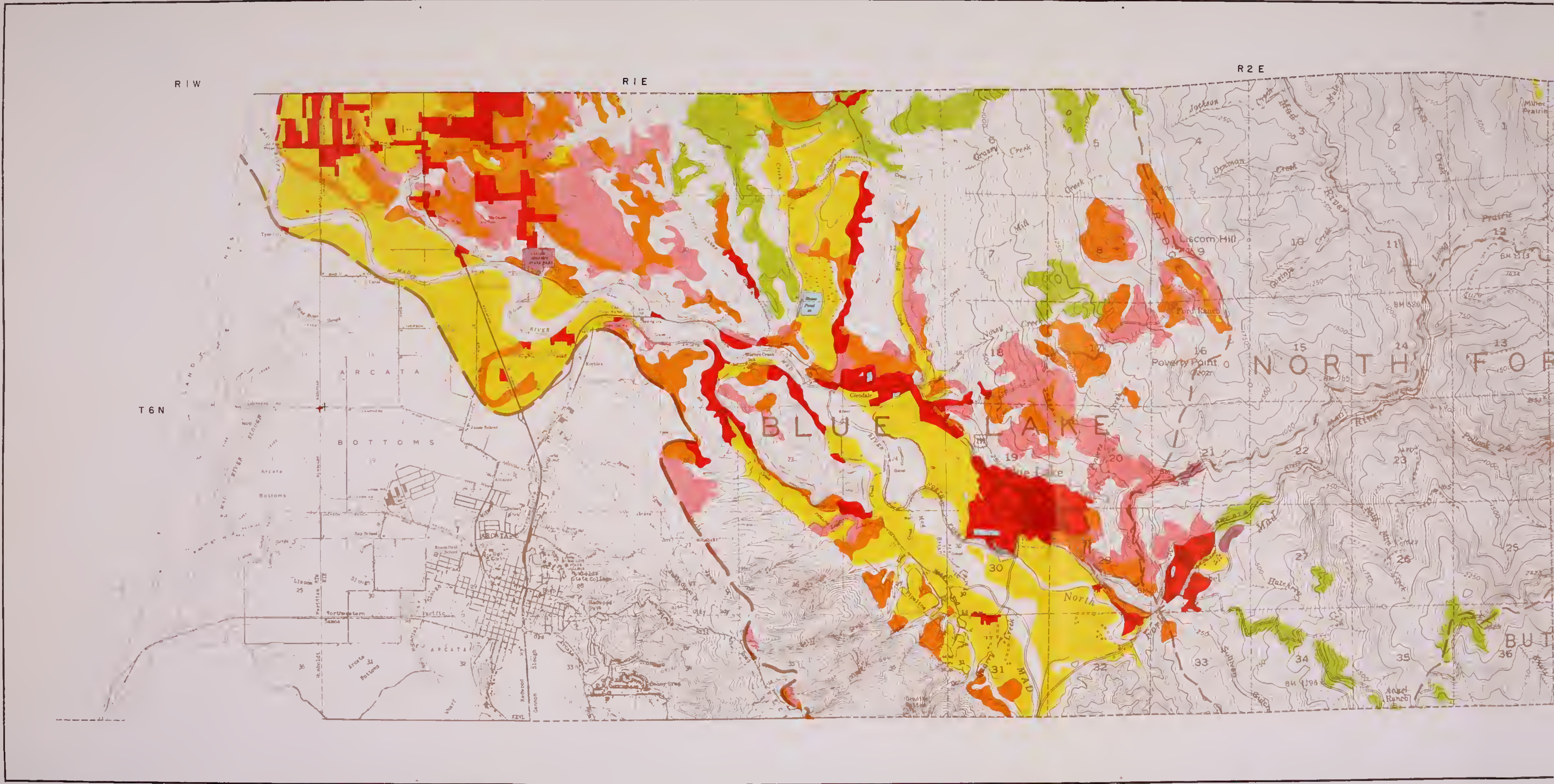
◆

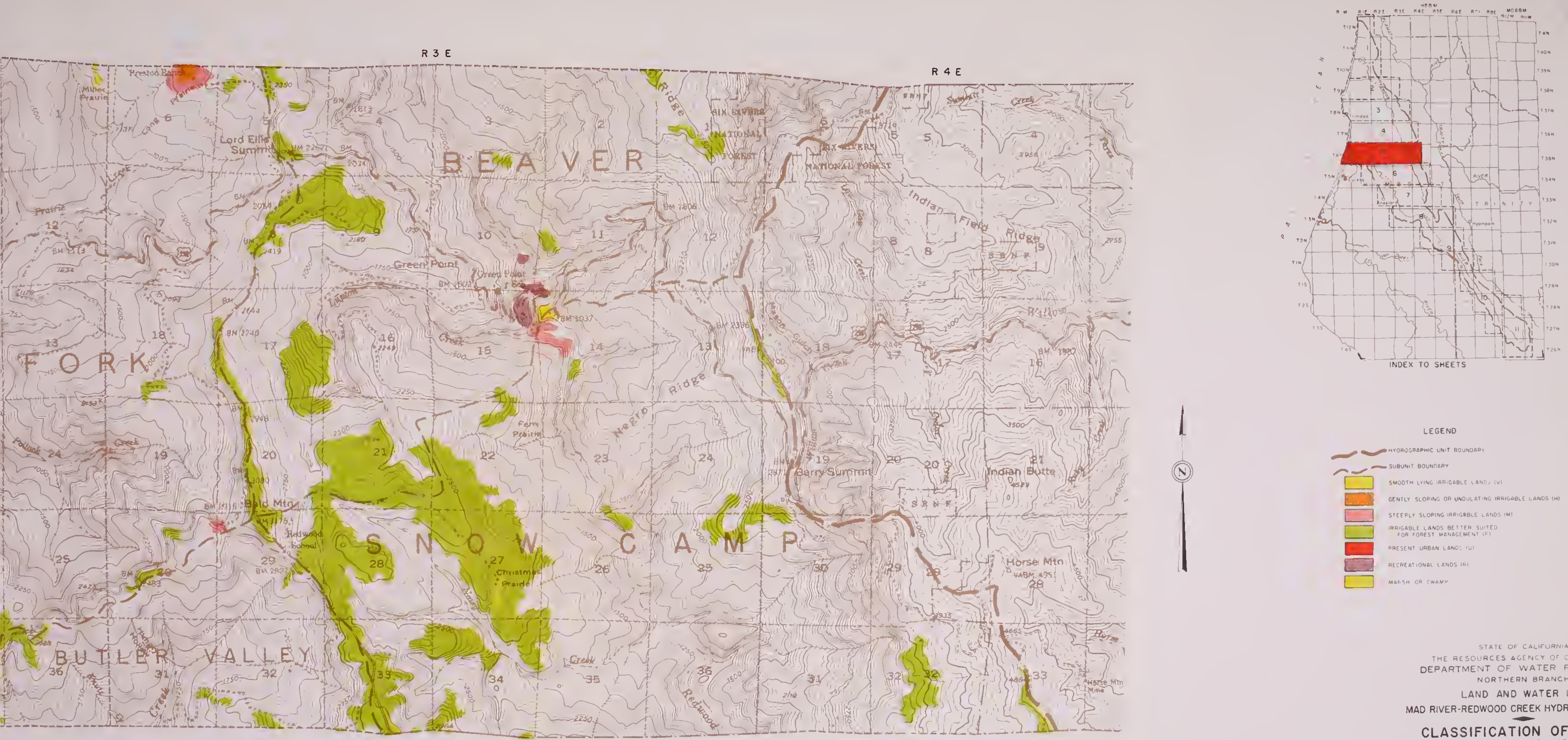
CLASSIFICATION OF LANDS

T 6 N, R 1 W - 4 E HB&M

1958

SCALE OF FEET
2000 0 2000 4000 6000


R I W
R I E
R 2 E
T 6 N
A R C A T A
B O T T O M S
Arcata Bottoms
ARCATA
Humboldt State College
BLUE LAKE
Blue Lake
Glendale
MAD RIVER
NORTH FORK
North Fork
Liscom Hill
Ford Ranch
Poverty Point
Grassy Creek
Mill Creek
Noisy Creek
Jackson Creek
Dryden Creek
Hatchery
Angel Ranch
Prairie
BUT



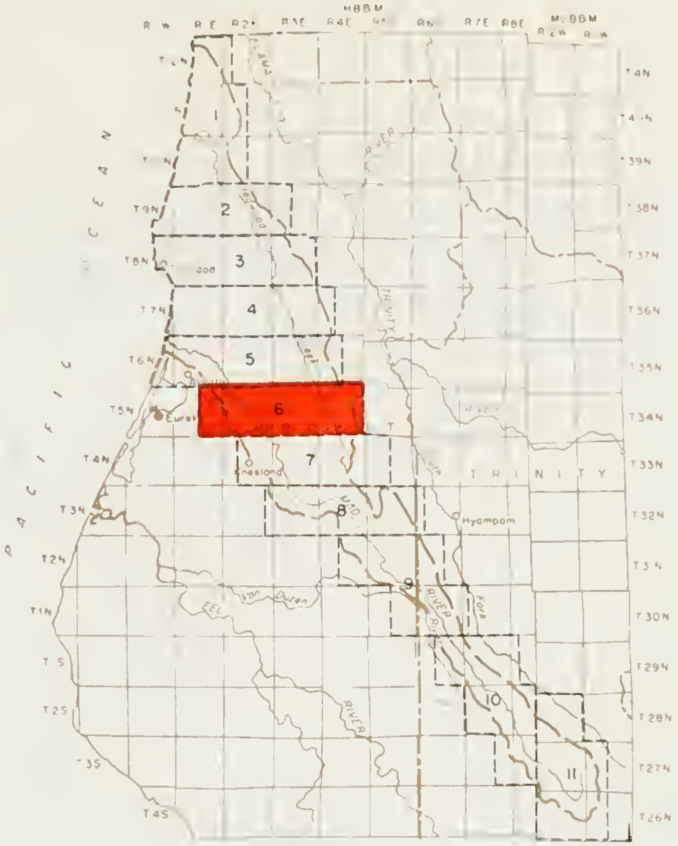
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T 6 N, R1W-4E HBBM
1958

SCALE OF FEET



INDEX TO SHEETS

LEGEND

HYDROGRAPHIC UNIT BOUNDARY

SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

▨ STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

NONE PRESENT URBAN LANDS (U)

🟥 RECREATIONAL LANDS (R)

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

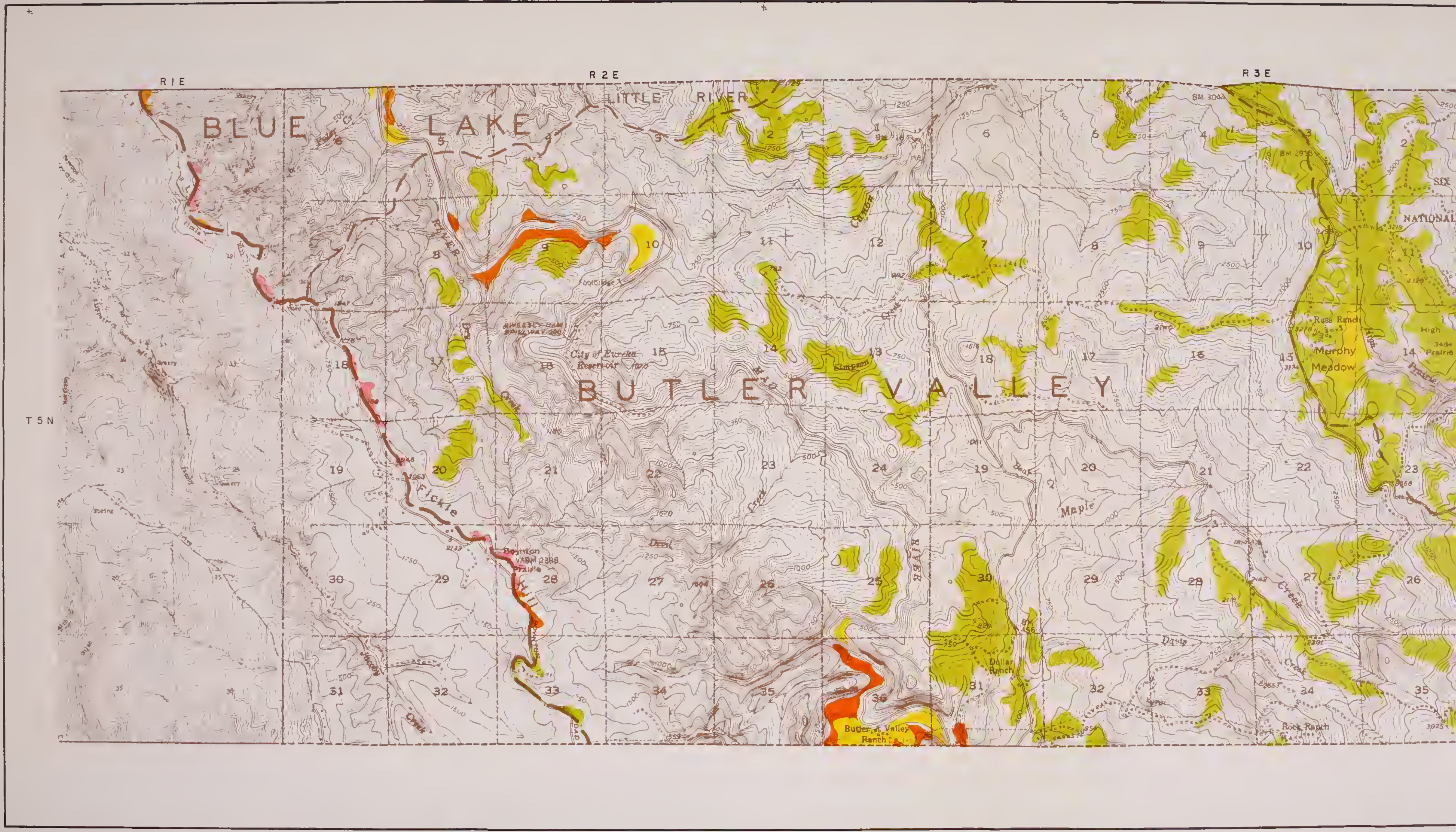
CLASSIFICATION OF LANDS

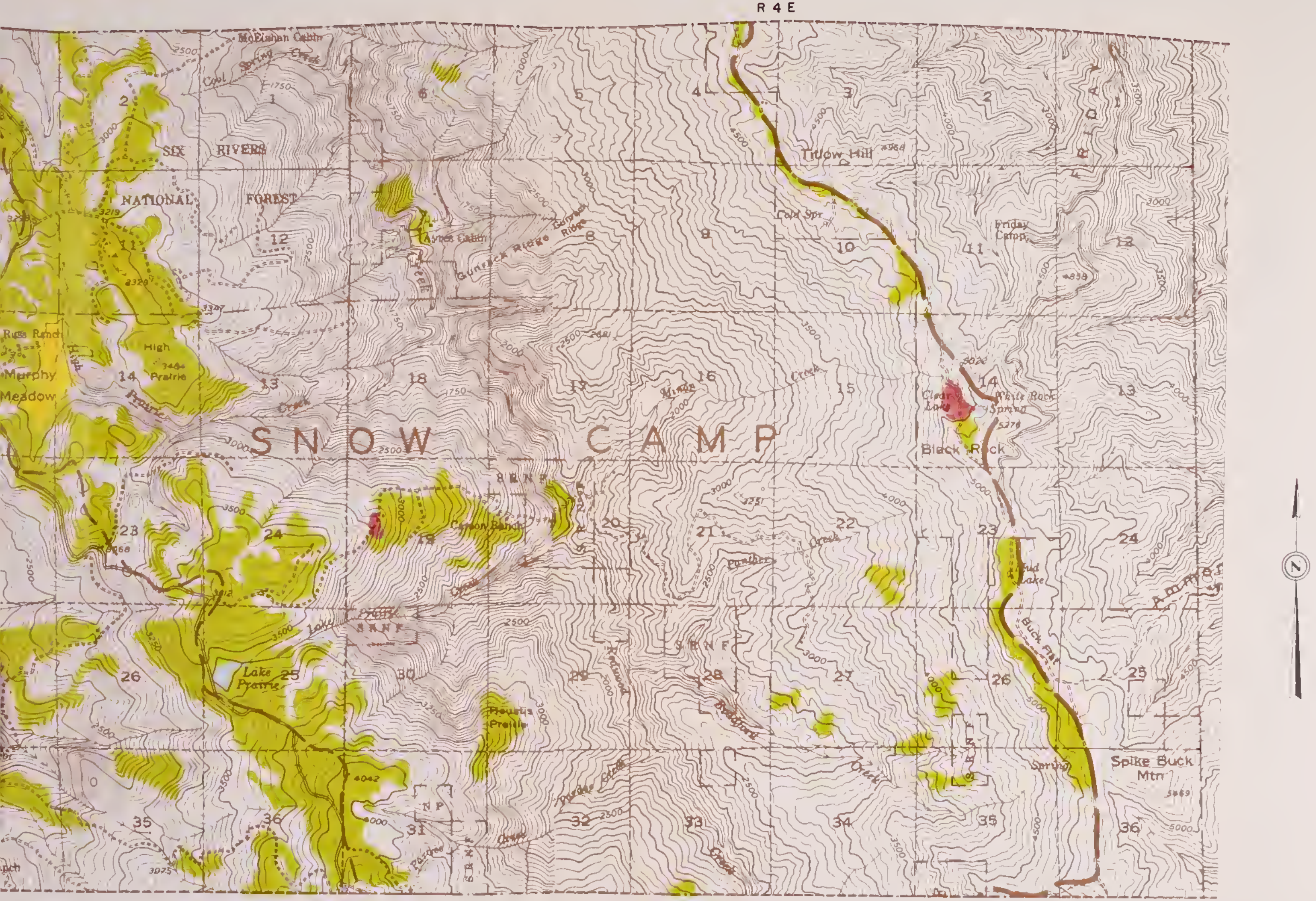
T 5 N, R1-4E HB&M

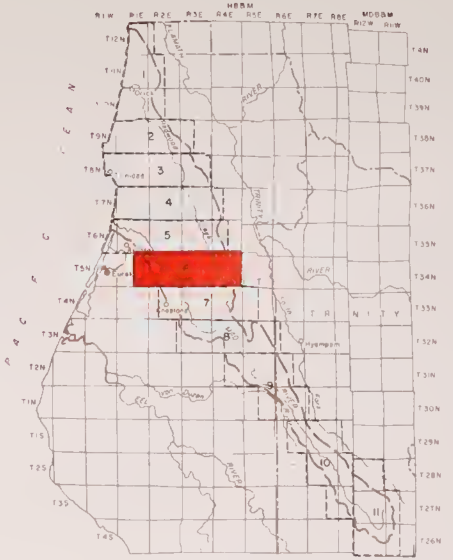
1958

SCALE OF FEET

2000 0 2000 4000 6000


R1E
R2E
R3E
T5N
BLUE LAKE
LITTLE RIVER
BUTLER VALLEY
City of Eureka Reservoir
Fickle Hill
Boynton Prairie
Simpson
Mad River
Maple
Dolla Ranch
Butler Valley Ranch
Rock Ranch
Russ Ranch
Murphy Meadow
High Prairie
SIX
NATIONAL
Canon Creek
Dead
Boulder Creek
Quarry
Spring
Road
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36





INDEX TO SHEETS

LEGEND

- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- 🟨 SMOOTH LYING IRRIGABLE LANDS (V)
- 🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
- 🟥 STEEPLY SLOPING IRRIGABLE LANDS (M)
- 🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
- NONE PRESENT URBAN LANDS (U)
- 🟥 RECREATIONAL LANDS (R)

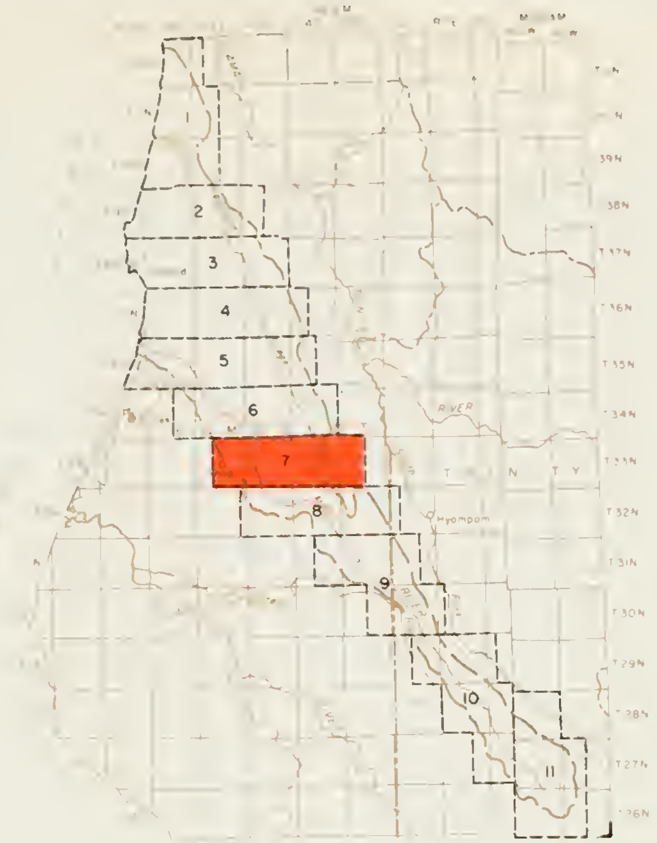
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T 5 N, R1-4E H B & M
1958

SCALE OF FEET
2000 0 2000 40



INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY
〰 SUBUNIT BOUNDARY
🟨 SMOOTH LYING IRRIGABLE LANDS (V)
🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
▨ STEEPLY SLOPING IRRIGABLE LANDS (M)
🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
🟥 PRESENT URBAN LANDS (U)
🟪 RECREATIONAL LANDS (R)

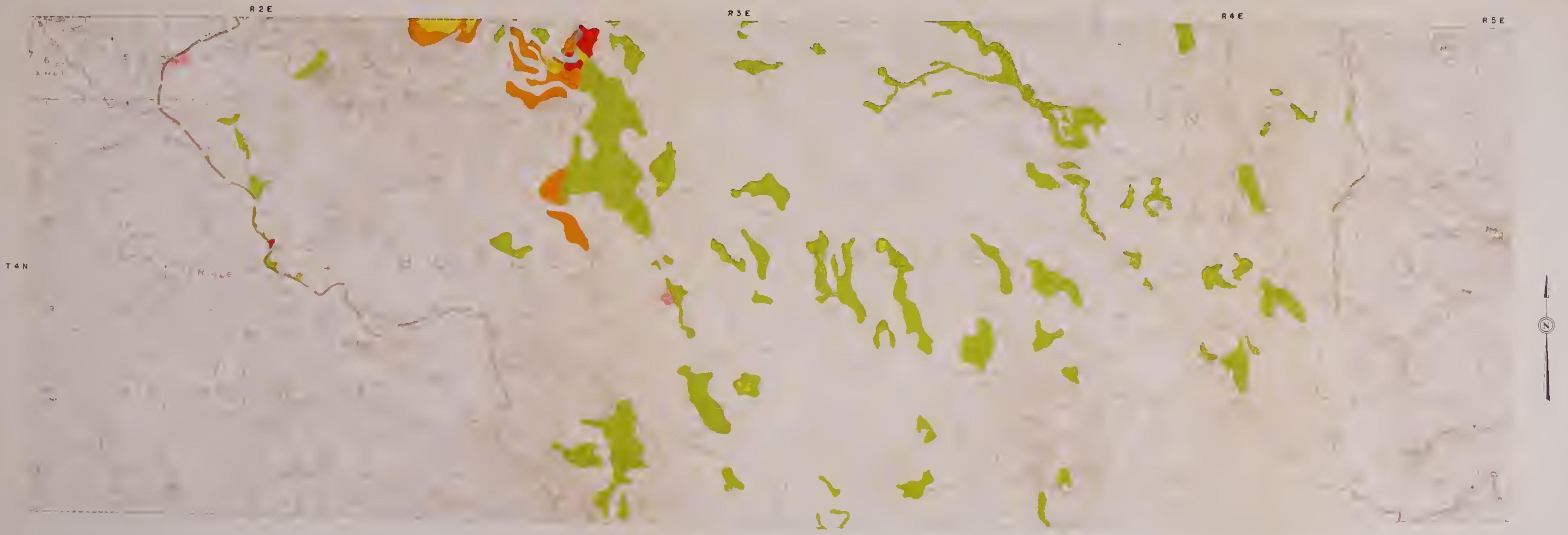
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

◆

CLASSIFICATION OF LANDS
T 4 N, R 2-5 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



INDEX TO SHEETS

LEGEND

- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- 🟨 SMOOTH LYING IRRIGABLE LANDS (V)
- 🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
- 🟥 STEEPLY SLOPING IRRIGABLE LANDS (H)
- 🟩 IRRIGABLE LANDS BEST OR SUITED FOR FOREST MANAGEMENT (F)
- 🟥 PRESENT URBAN LANDS (U)
- 🟪 RECREATIONAL LANDS (R)

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

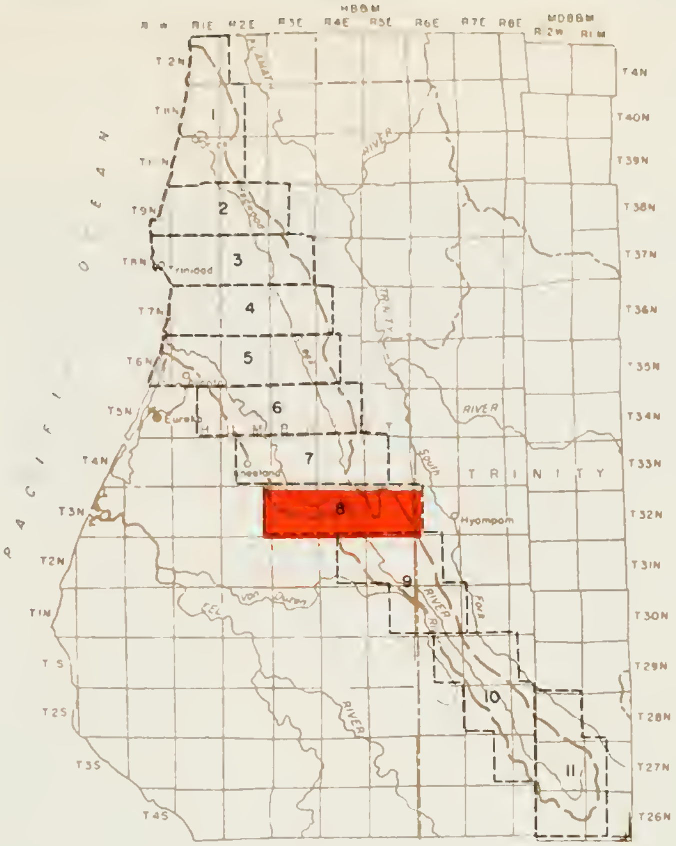
LAND AND WATER USE

MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T 4 N, R 2-5 E HB&M
1958

SCALE OF FEET
4000 6000



INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY

〰 SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

🟥 STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

NONE PRESENT URBAN LANDS (U)

▨ RECREATIONAL LANDS (R)

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

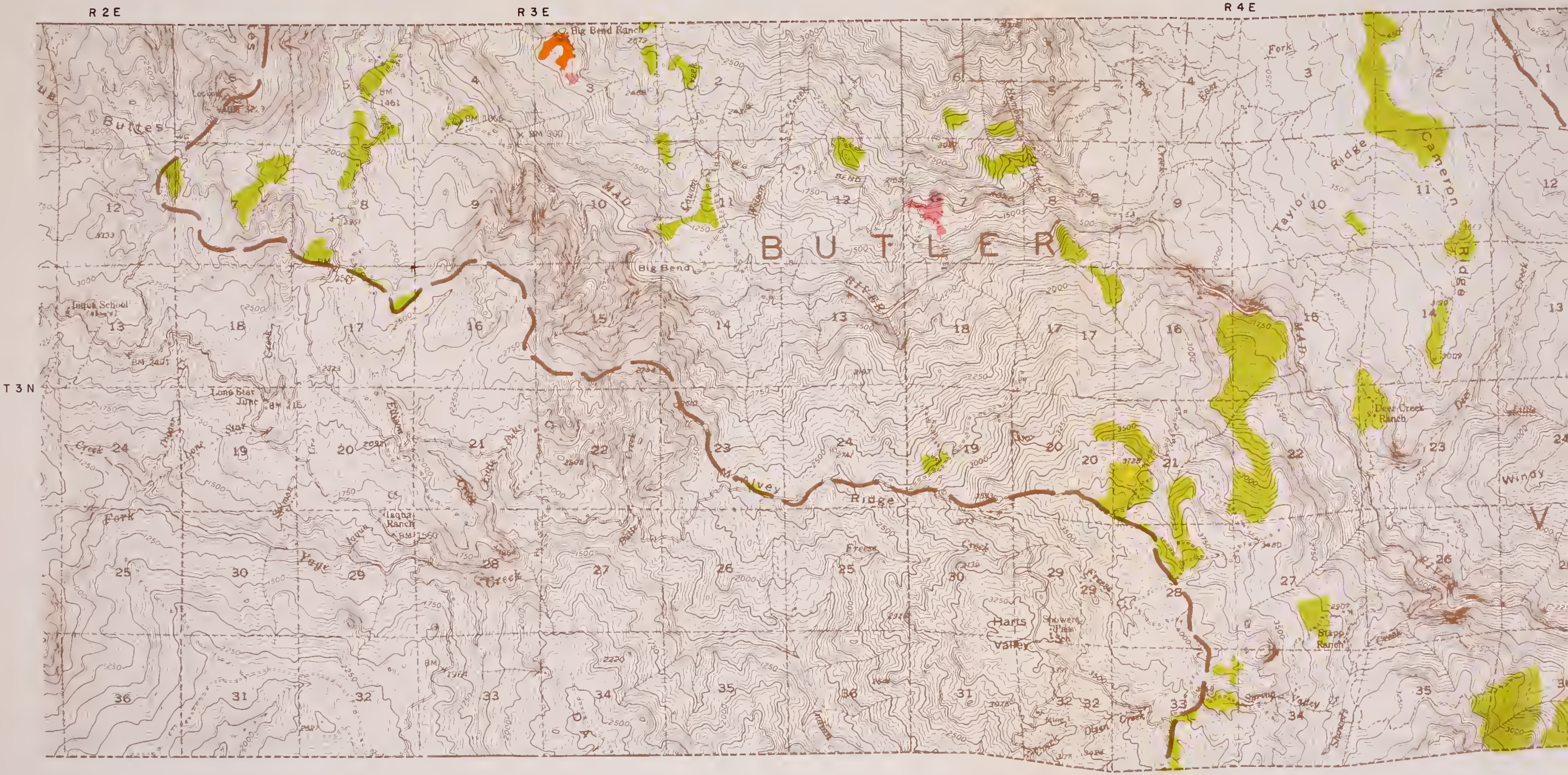
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

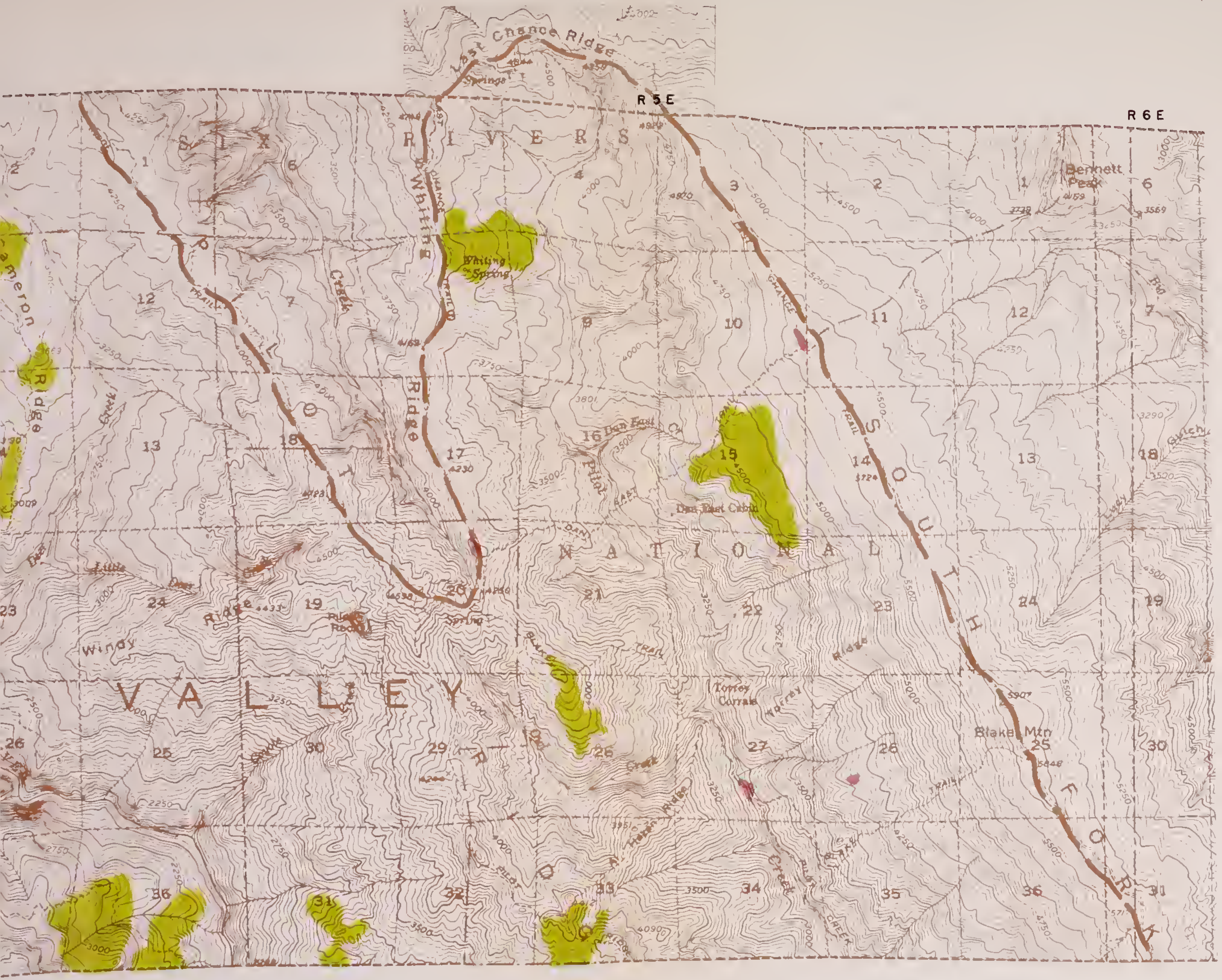
◆

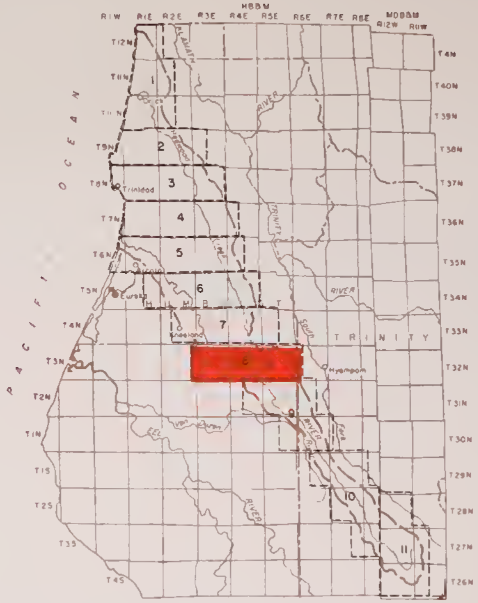
CLASSIFICATION OF LANDS

T 3 N, R 2-6 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R 2 E
R 3 E
R 4 E
T 3 N
Buttes
Big Bend Ranch
BUTLER
Big Bend
MAD
RIVER
Iaqua School
Lone Star Junc
Iaqua Ranch
Yager
Creek
Fork
McIlvey Ridge
Freese Creek
Harts Valley
Showers Pass
Taylor Ridge
Cameron Ridge
Deer Creek Ranch
Stapp Ranch
Windy
Spring Valley





INDEX TO SHEETS

LEGEND

HYDROGRAPHIC UNIT BOUNDARY

SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

🟥 STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

NONE PRESENT URBAN LANDS (U)

🟪 RECREATIONAL LANDS (R)

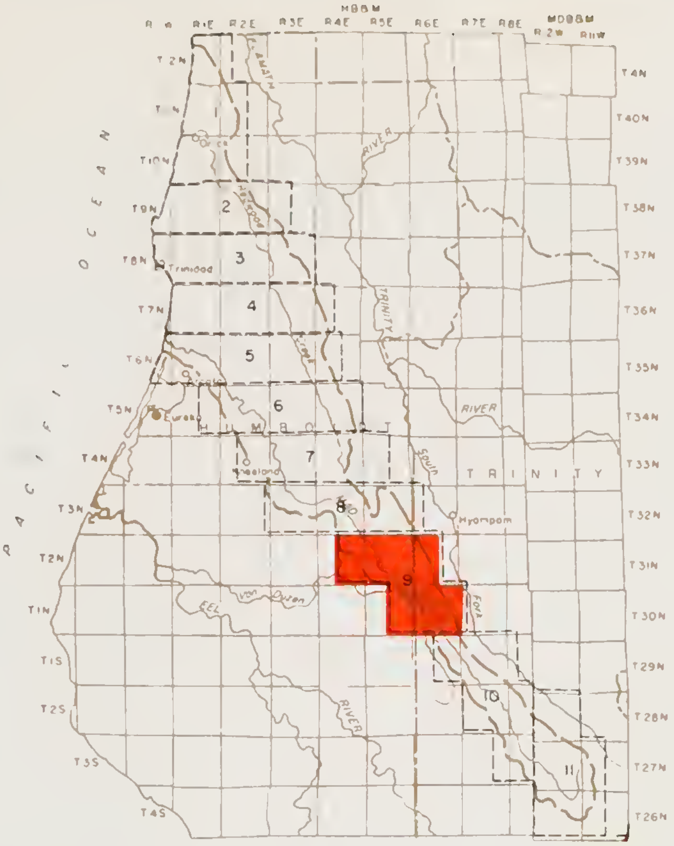
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T 3 N, R 2-6 E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



INDEX TO SHEETS

LEGEND

〰	HYDROGRAPHIC UNIT BOUNDARY
〰	SUBUNIT BOUNDARY
🟨	SMOOTH LYING IRRIGABLE LANDS (V)
🟧	GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
NONE	STEEPLY SLOPING IRRIGABLE LANDS (M)
🟩	IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
NONE	PRESENT URBAN LANDS (U)
🟥	RECREATIONAL LANDS (R
	RESERVOIR UNDER CONSTRUCTION

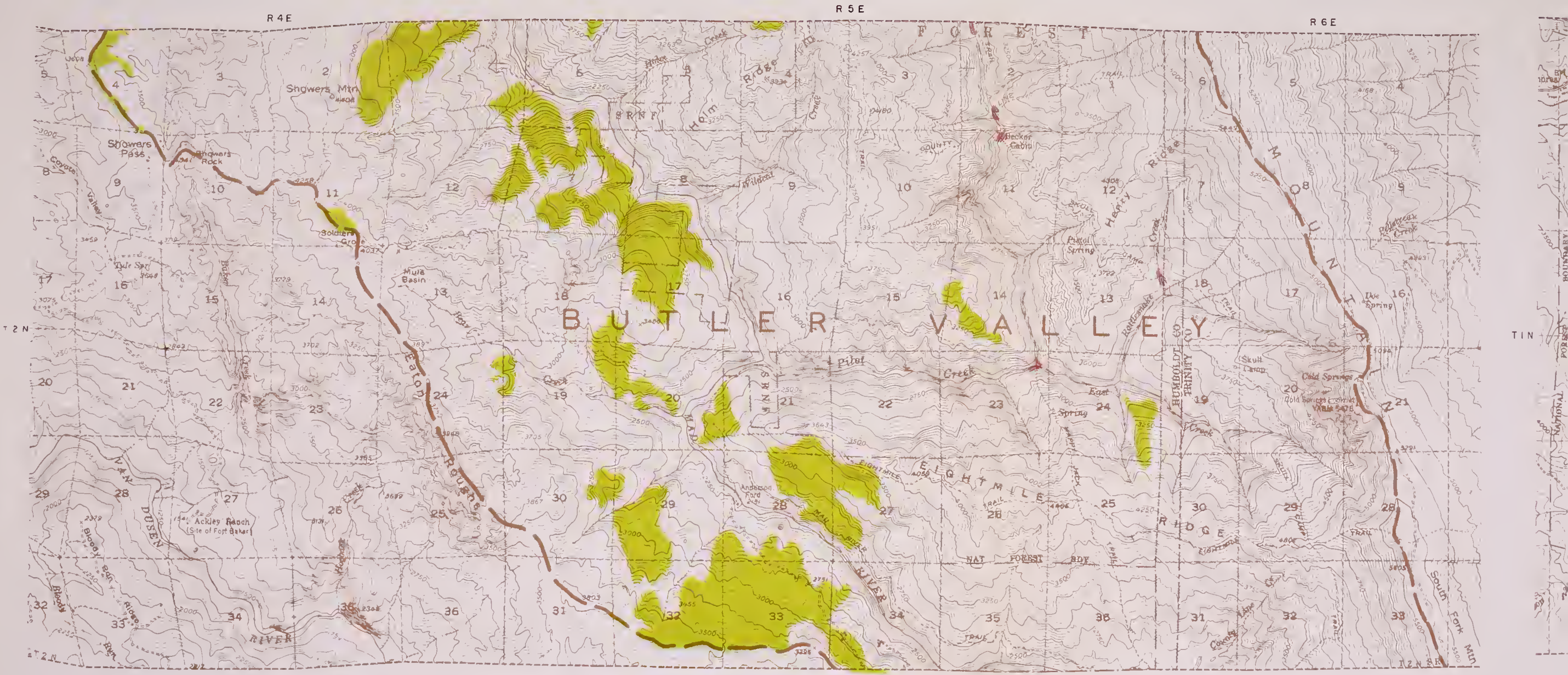
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

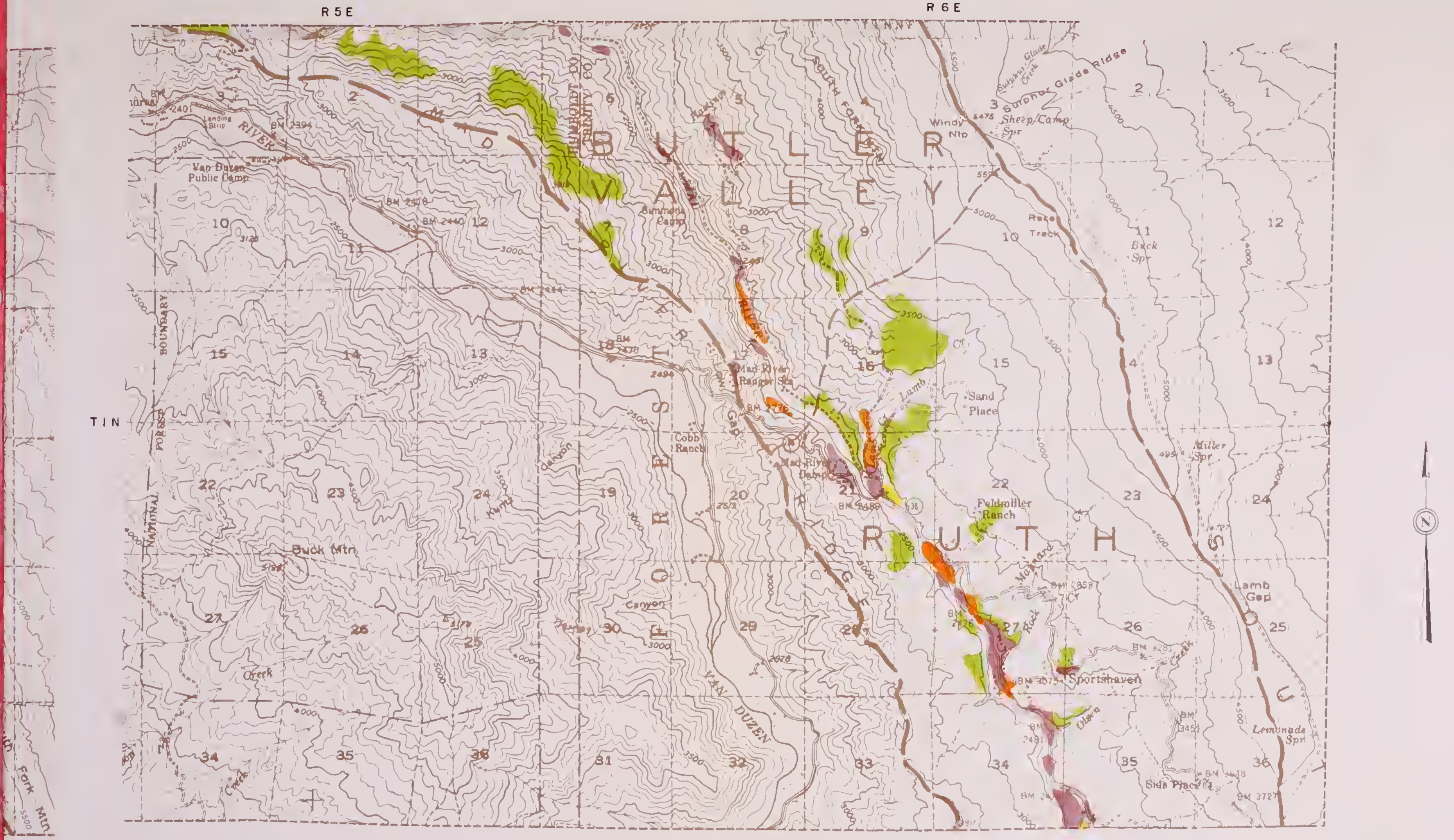
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

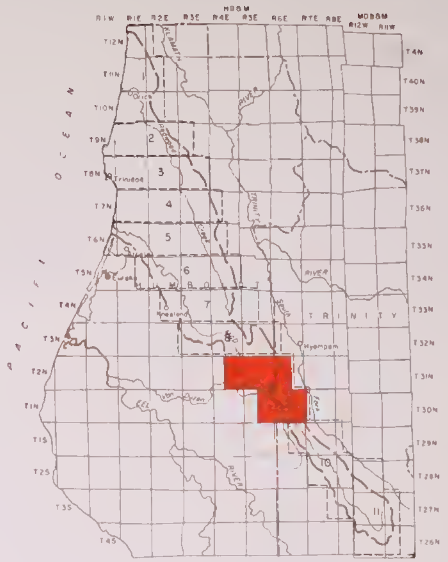
CLASSIFICATION OF LANDS

T1-2N, R4-6E HBBM
1958

SCALE OF FEET
2000 0 2000 4


R 4 E
R 5 E
R 6 E
T 2 N
T 1 N
T 2 N
BUTLER VALLEY
FOREST
MOUNTAIN
Showers Mtn
Showers Pass
Showers Rock
Soldiers Grove
Mule Basin
Coyote Valley
Tyle Spr
VAN DUSEN RIVER
Ackley Ranch (Site of Fort Baker)
Bloody Run
Eaton Roughs
Holm Ridge
Hidden Creek
Wildcat
Becker Cabin
Henry Ridge
Pistol Spring
Rattlesnake
Pilot Creek
Mad River
Anderson Ford
EIGHTMILE RIDGE
Eightmile Trail
NAT FOREST BDY
East Spring
HUMBOLDT CO
TRINITY CO
Skull Camp
Cold Springs
Cold Springs Lookout
Doe Spring
Pelletreau Creek
South Fork Mtn
County Line
Creek
TRAIL





INDEX TO SHEETS

LEGEND

- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- 🟨 SMOOTH LYING IRRIGABLE LANDS (V)
- 🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
- NONE STEEPLY SLOPING IRRIGABLE LANDS (M)
- 🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
- NONE PRESENT URBAN LANDS (U)
- 🟪 RECREATIONAL LANDS (R)
- RESERVOIR UNDER CONSTRUCTION

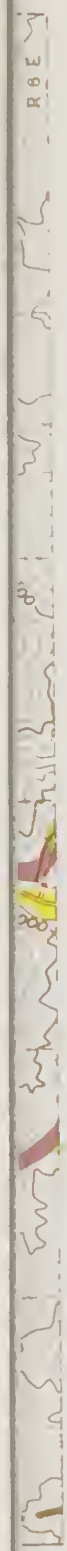
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

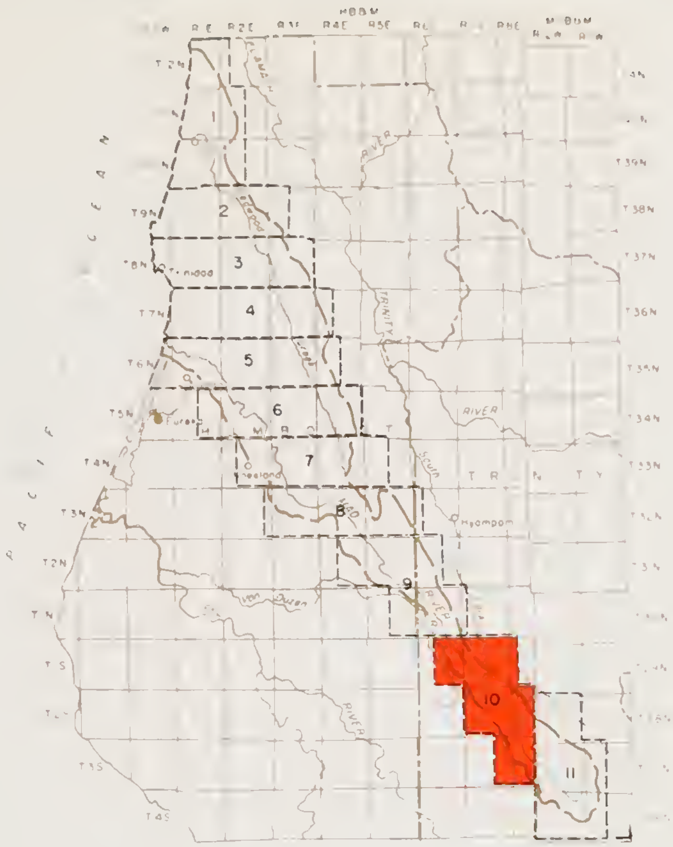
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

TI-2N, R4-6E HBBM
1958

SCALE OF FEET





INDEX TO SHEETS

LEGEND

HYDROGRAPHIC UNIT BOUNDARY

SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

NONE STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

🟥 PRESENT URBAN LANDS (U)

▨ RECREATIONAL LANDS (R)

▨ RESERVOIR UNDER CONSTRUCTION

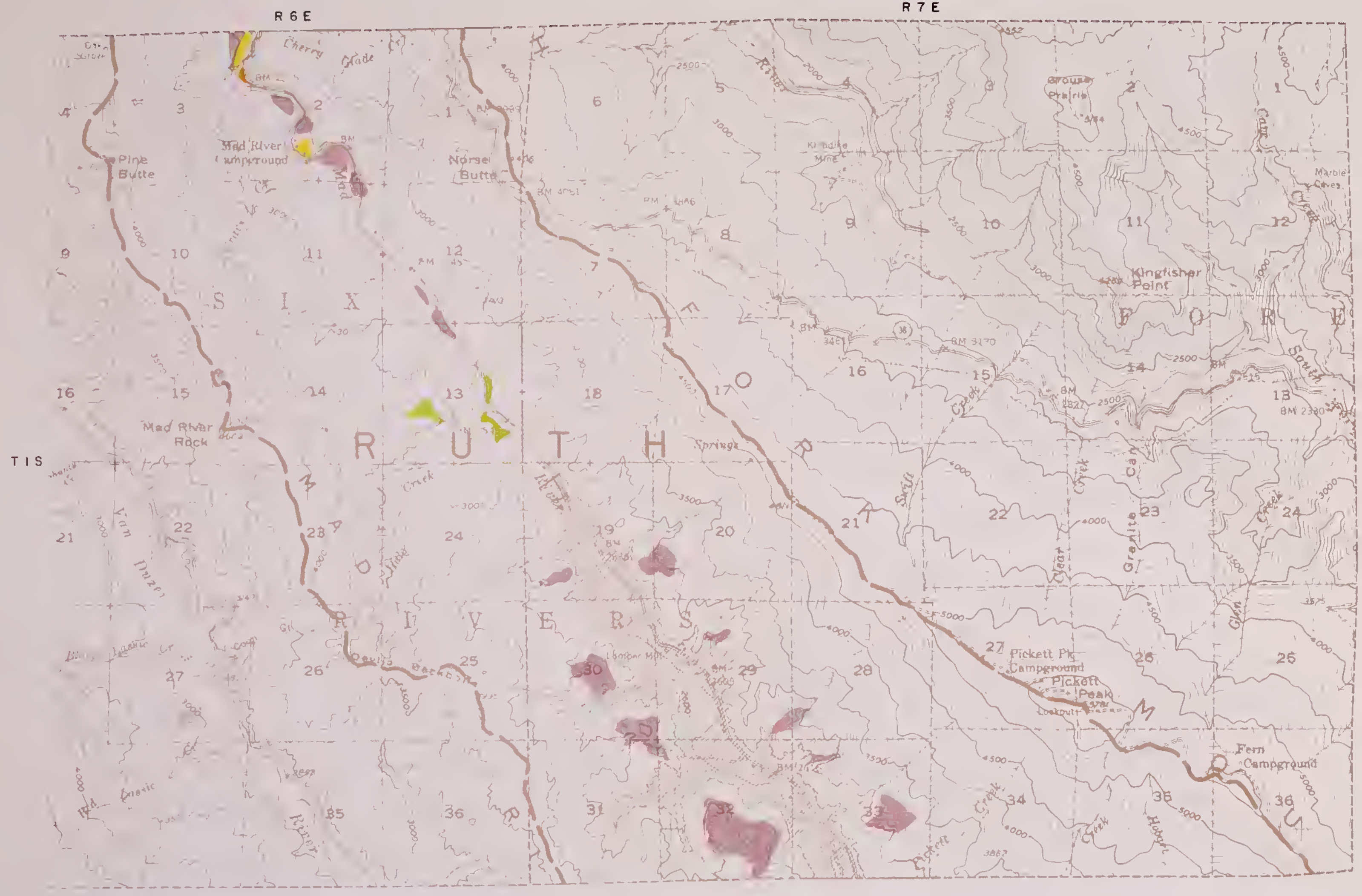
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

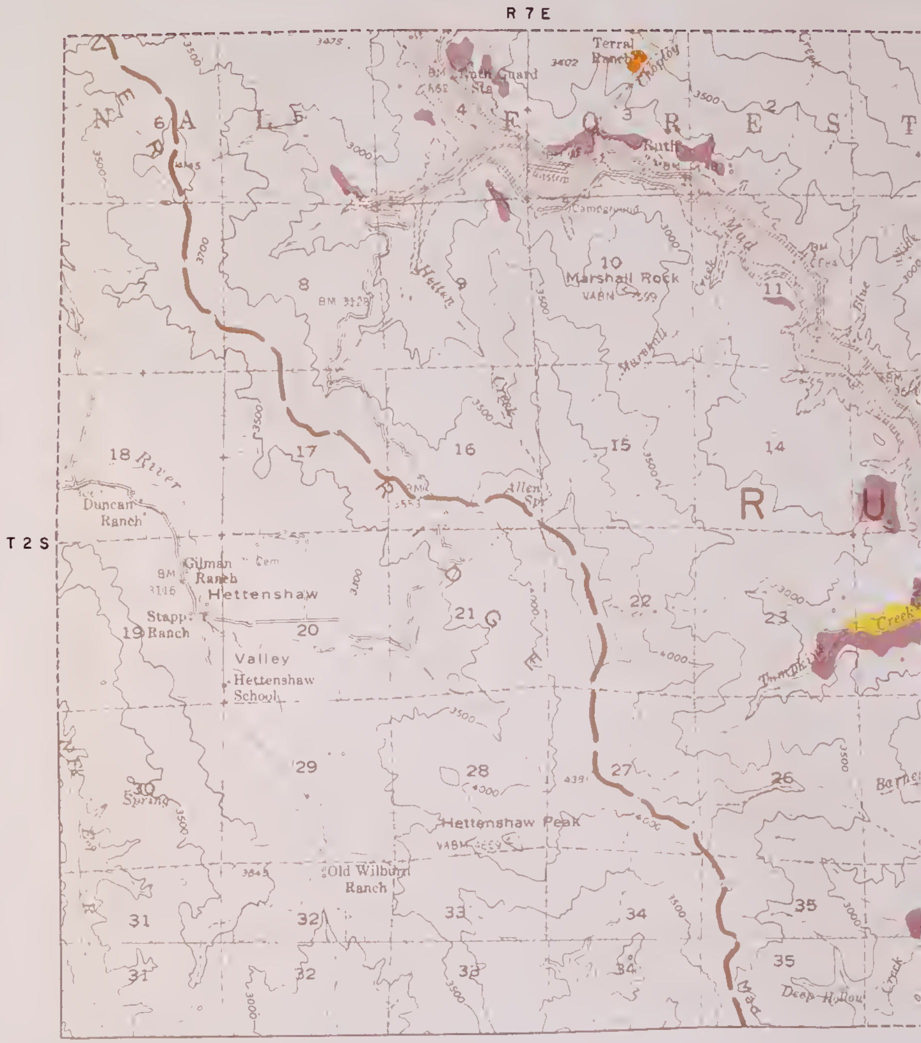
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

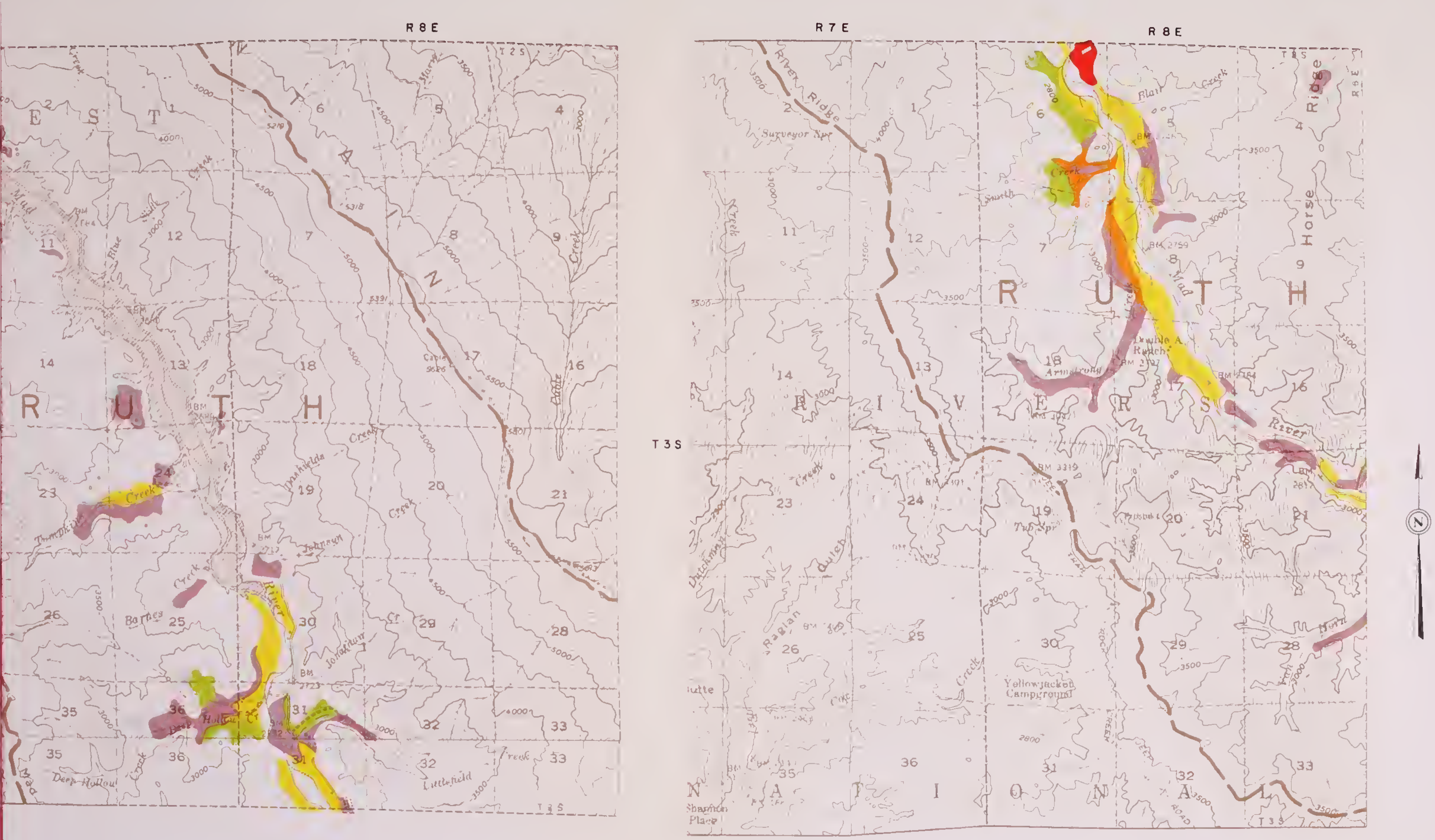
CLASSIFICATION OF LANDS

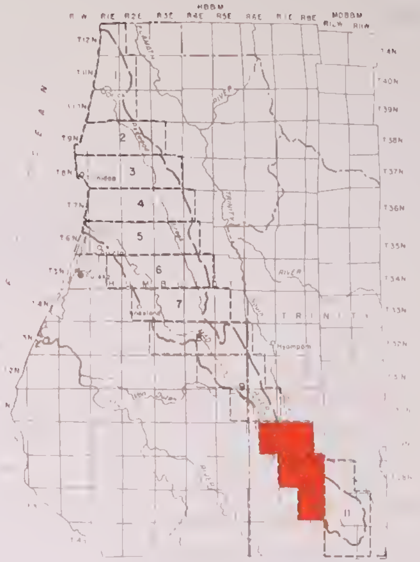
T1-3S, R6-8E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R 6 E
R 7 E
T 1 S
Cherry Glade
Mad River Campground
Pine Butte
Norse Butte
Mad River Rock
S I X
R U T H
F O R K
M A D
R I V E R S
F O R E S T
Kingfisher Point
Grouse Prairie
Klondike Mine
Marble Caves
Springs
Pickett Pk Campground
Pickett Peak
Lookout
Fern Campground
M O U
Van Duzen
Devils
Swift Creek
Clear Creek
Granite Creek
Cap Creek
Glen Creek
South
Pickett Creek
Hobart
Corr Creek
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36


R 7 E
T 2 S
N A T
F O R E S T
R U
Terral Ranch
Ranger Sta.
Ruth
Campground
Marshall Rock
Mad Creek
Hetten Creek
River
Duncan Ranch
Gilman Ranch
Hettenshaw
Stapp Ranch
Valley
Hettenshaw School
Hettenshaw Peak
Old Wilburn Ranch
Allen Spr.
Spring
R I D G E
Barnes
Deep Hollow
Creek
Mad
1
2
3
4
6
8
10
11
14
15
16
17
18
19
20
21
22
23
26
27
28
29
30
31
32
33
34
35





INDEX TO SHEETS

LEGEND

- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- 🟨 SMOOTH LYING IRRIGABLE LANDS (V)
- 🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
- NONE STEEPLY SLOPING IRRIGABLE LANDS (M)
- 🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
- 🟥 PRESENT URBAN LANDS (U)
- 🟪 RECREATIONAL LANDS (R)
- RESERVOIR UNDER CONSTRUCTION

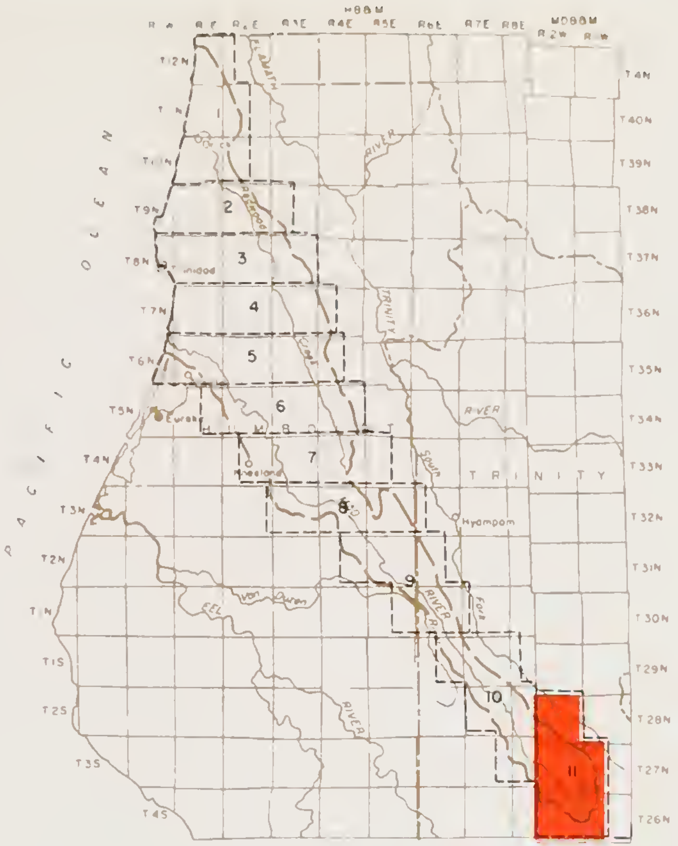
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T1-3S, R6-8E HB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000



INDEX TO SHEETS

LEGEND

- HYDROGRAPHIC UNIT BOUNDARY
- SUBUNIT BOUNDARY
- 🟨 SMOOTH LYING IRRIGABLE LANDS (V)
- 🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)
- NONE STEEPLY SLOPING IRRIGABLE LANDS (M)
- 🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)
- NONE PRESENT URBAN LANDS (U)
- 🟪 RECREATIONAL LANDS (R)

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

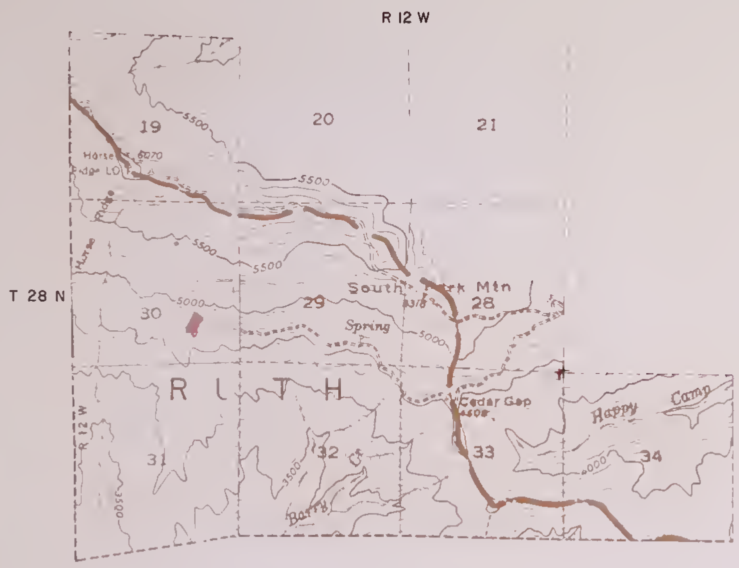
LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

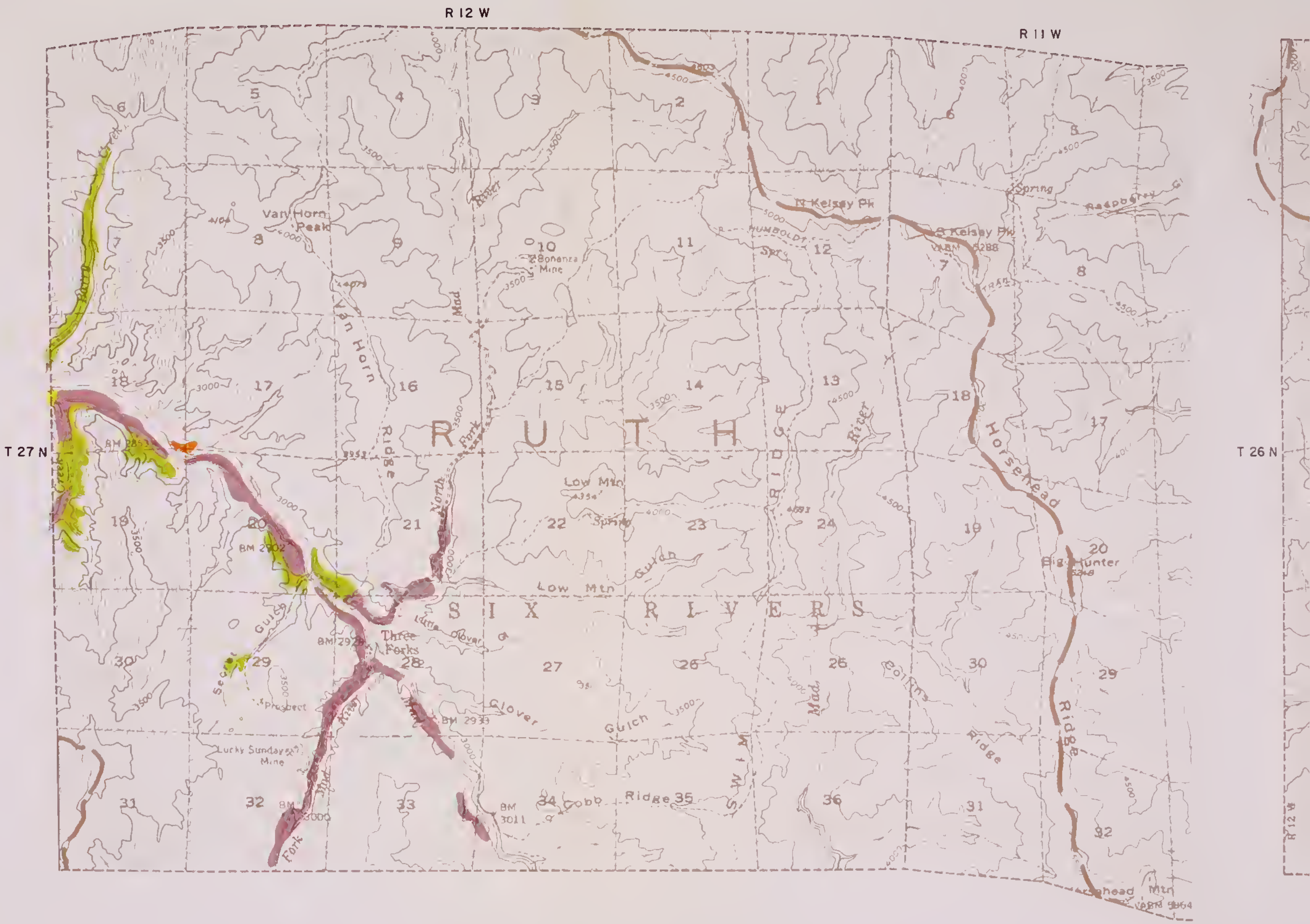
◆

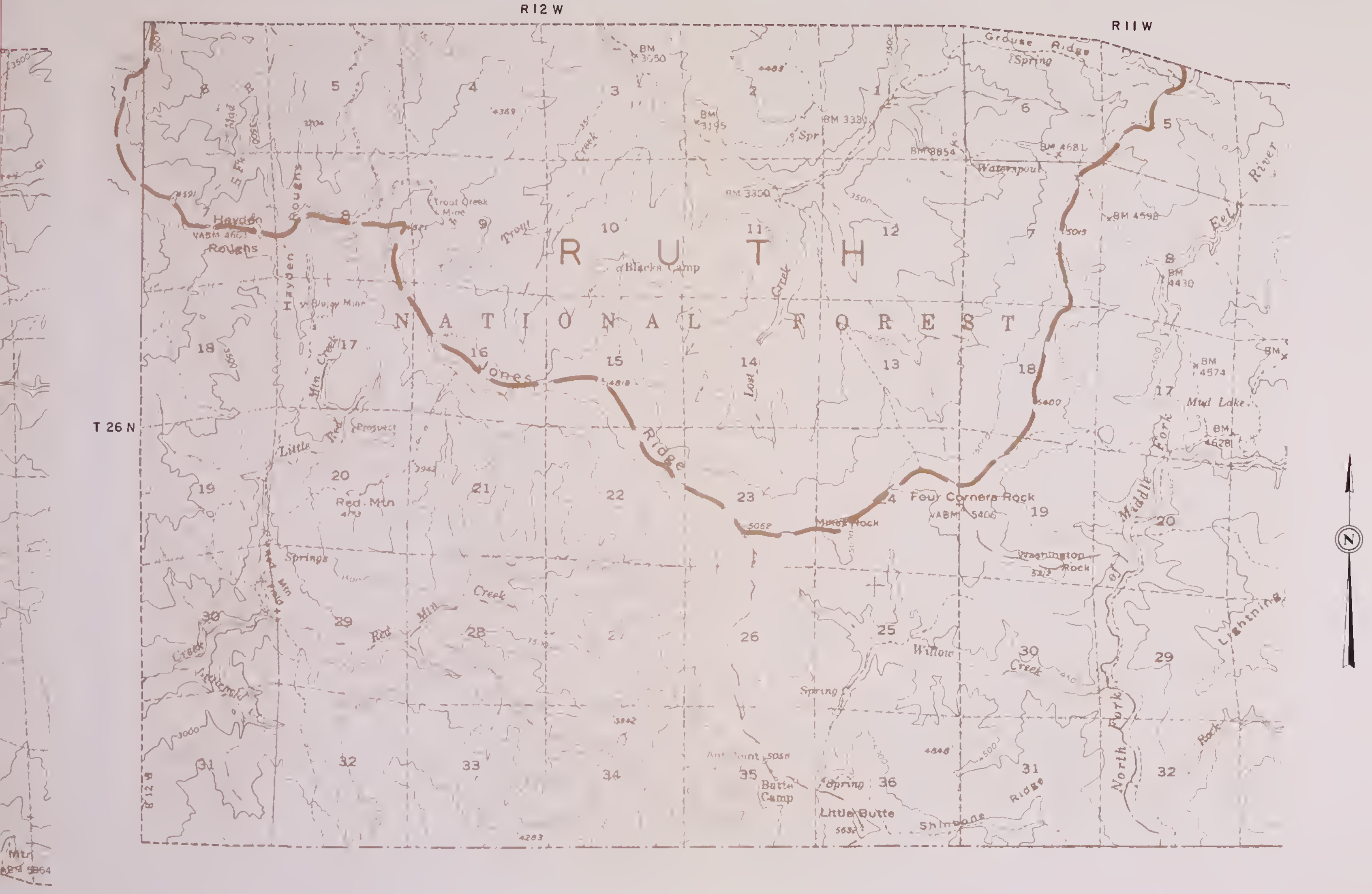
CLASSIFICATION OF LANDS

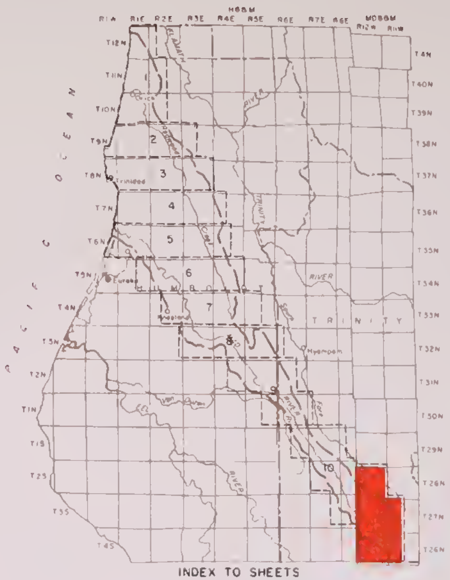
T26-28N, R11-12W MDB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000


R 12 W
T 28 N
R 12 W
19
20
21
Horse Ridge LO
5070
5500
South Fork Mtn
5318
28
29
30
Spring
5000
R U T H
Cedar Gap
4508
Happy Camp
31
32
33
34
Barry Cr
3500
4000


R 12 W
R 11 W
T 27 N
T 26 N
5
4
3
2
1
6
5
6
Van Horn Peak
8
9
10
Bonanza Mine
11
N Kelsey Pk
S Kelsey Pk
5288
HUMBOLDT
Spr
12
7
8
Spring
Raspberry
Van Horn Ridge
Mad River
North Fork
18
17
16
15
14
13
18
17
R U T H
Ridge
Horsehead
Low Mtn
4354
22
Spring
23
24
19
20
Big Hunter
5348
BM 2852
BM 2902
21
Low Mtn Gulch
S I X R I V E R S
Three Forks
28
Little Clover Cr
BM 2928
Secret Gulch
29
30
27
26
25
30
29
Prospect
Clover Gulch
Mad
Collins Ridge
Horsehead Ridge
BM 2933
Lucky Sunday Mine
31
32
BM 3000
33
BM 3011
34
Cobb Ridge
35
S W Mad
36
31
32
Horsehead Mtn
BM 5964
R 12 W
3000
3500
4000
4500





INDEX TO SHEETS

LEGEND

〰 HYDROGRAPHIC UNIT BOUNDARY

〰 SUBUNIT BOUNDARY

🟨 SMOOTH LYING IRRIGABLE LANDS (V)

🟧 GENTLY SLOPING OR UNDULATING IRRIGABLE LANDS (H)

NONE STEEPLY SLOPING IRRIGABLE LANDS (M)

🟩 IRRIGABLE LANDS BETTER SUITED FOR FOREST MANAGEMENT (F)

NONE PRESENT URBAN LANDS (U)

🟪 RECREATIONAL LANDS (R)

STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

LAND AND WATER USE
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

CLASSIFICATION OF LANDS

T26-28N, R11-12W MDB&M
1958

SCALE OF FEET
2000 0 2000 4000 6000

b

THIS BOOK IS DUE ON THE LAST DATE
STAMPED BELOW

RENEWED BOOKS ARE SUBJECT TO IMMEDIATE
RECALL

UCD LIBRARY
DUE SEP 29 1971

JUL 16 REC'D

RECEIVED
APR 6 1981

APR 17 1981

PHYS SCI LIBRARY

LIBRARY, UNIVERSITY OF CALIFORNIA, DAVIS

Book Slip-50m-12,'64(F772s4)458

3 1175 00641 742

3S1778

Calif. Dept. of Water
Resources.
Bulletin.

TC824
C2
A2
no.94:7
1965

PHYSICAL
SCIENCES
LIBRARY

LIBRARY
UNIVERSITY OF CALIFORNIA
DAVIS